LECTURES

ON THE

MATERIA MEDICA,

AS DELIVERED

By WILLIAM CULLEN, M.D.

PROFESSOR of MEDICINE in the University of EDINBURGH.

Now Published by Permission of the AUTHOR,

And with many CORRECTIONS from the Collation of different MANUSCRIPTS by the EDITORS.

LONDON,
Printed for T. LOWNDES, in FLEET-STREET.
MDCCLXXIII.
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PREFACE.

THE following Sheets are offered to the World as containing the ſubſtance of a Courſe of Lectures on the Materia Medica, delivered by a celebrated Profeſſor at Edinburgh. As they are not alledged to be printed by his direction, it may ſeem neceſſary to lay before the Public the reaſons which induced the Editors to this ſtep, as nothing can be farther from their thoughts than the leaſt intention of injuring either the fame or intereſt of that Gentleman, for whoſe mind and abilities they have the higheſt admiration and eſteem. This is ſo far the caſe, that they would think themſelves extremely happy, if, on a ſight of this Work, the learned Author could be induced to favour the world with his improved ſentiments on this ſubject, which could not fail of being a moſt uſeful, as well as an acceptable preſent to the Public. The Editors have no

other motive for making this Work public, than a concern to find a Performance, which ſo far excells in method, copiouſneſs of thought, liberality of ſentiment, and judgment, all that have been before written on the ſubject, in danger of being loſt to the world.

Near the end of 1761, and about the time when, by the academical rules of the Univerſity of Edinburgh, the Lectures on Medical Subjects ought to begin, Dr. Alſton, who was at that time Profeſſor of the Materia Medica, died. By this unexpected event, the Univerſity would have received an injury, if Dr. Cullen, who was then Profeſſor of Chemiſtry, had not voluntarily offered to ſupply the place of Dr. Alſton, in reading Lectures on the Materia Medica for that ſeaſon.

This was gladly accepted, and the offer was made with greater propriety, as the ſtudy in which he was then principally engaged as a Profeſſor, led more directly to this ſubject, than any other branch of Phyſic whatever.

It is obvious to every one's underſtanding, how difficult it was for the learned Author to acquit himſelf properly in this arduous taſk. Notwithſtanding this diſcouraging circumſtance, our Profeſſor attempted a plan entirely

entirely new and original, and executed the ſame in a manner which gained univerſal approbation. The ſubſtance of that Performance is the Work now offered to the Public, which, during an interval of eight years paſt, has been much deſired by the Faculty, and it was long hoped that the learned Author himſelf would have been induced to communicate them to the world: But, it is preſumed, that his other avocations and extenſive practice have not afforded him ſufficient leiſure for ſuch an Undertaking.

The enſuing Sheets are printed from a correct copy, which has been carefully compared with ſeveral others. If, after all, any inaccuracies in the ſtyle ſhould have eſcaped, they are not, in the ſlighteſt degree, to be imputed to the Author, whoſe manner of expreſſion is as pure and elegant, as the matter he delivers is great and original.

In ſhort, the merit of the Performance ſtands in need of no eulogium, and the method is too clear to require explanation, eſpecially as the original Syllabus is ſubjoined, with the blank ſpaces filled up (in *Italics*,) as directed to be done in the Courſe of the Lectures. This is the only material alteration that the Editors have made, and the propriety of this will ſcarcely be queſtioned.

LEC-

ERRATA.

P. 44. l. 13. *for* ariſtolochia, *read* ariſtolochica.
P. 49. l. 1. *r.* the food, *inſtead of* becoming acid.
P. 52. l. 6, *ab imo*, *for* idoſyncraſy, *r.* idioſyncraſy.
P. 159. l. 3. *r.* punctum interrogandi.
P. 240. l. 22. *r.* is *induced on* the ſyſtem.
P. 261. l. 4. *ab imo*, *r.* Alliaria.
P. 302. l. 13. *r.* among the Aromata, or here among the Bitters.

Additional PREFACE.

THE EDITORS, in publiſhing theſe Lectures, hoped they were not doing a thing diſagreeable to the Author, but in this they were miſtaken, and, ſoon after the Publication, found he did not approve of it; he complained that the Work was by no means ſufficiently perfect to do him honour; he ſaid it was originally imperfect, having been unexpectedly undertaken, and neceſſarily executed in great hurry; and it was ſtill more imperfect from the inaccuracy of the Gentlemen who had taken theſe Notes of the Lectures. In ſhort, the Doctor ſaw all this in ſo ſtrong a light, that, as ſoon as he was informed of the Publication, he applied for, and obtained from the Lord Chancellor, an Injunction, prohibiting the Sale of the Book. Upon this occaſion the Editors, who never meant to do any thing diſagreeable to the Author, applied to himſelf for leave to renew the ſale. The ſame reaſons, however, which made him diſapprove of the firſt publication, made him very unwilling to admit of it again; but finding that many copies of the book had been diſperſed before the Injunction was ſerved, being at the ſame time perſuaded of the innocent intentions of the Editors, and ſolicited by ſeveral of his Friends, he has at length con-

consented to the sale of the remainder of the impression, upon this condition, that the Editors, by collating several other Manuscripts, should endeavour to correct many errors. This condition the Editors have now complied with as well as they can, and have received from several Manuscripts such improvements as occasioned the re-printing of the first sheet, and enabled them to give many corrections in other parts of the Work. They hope they have done enough to shew what might be expected from the accuracy of the Author's own hand put to such a Work, and for which they would have willingly waited, but they are assured by himself, that his other occupations, and time of life, make it very probable that he never will engage in it.

LECTURES

ON THE

MATERIA MEDICA, 1761.

A Knowledge of the Materia Medica comprehends a knowledge of all the ſubſtances employed in preventing or curing diſeaſes, and therefore of all thoſe employed either in diet or medicine. Different authors have followed different methods in delivering the knowledge of this part of ſcience, all of them liable to objections, which need not be here pointed out. I ſhall ſhew you the plan which I intend to follow; and, if you ſhall be convinced of the propriety of this, you will eaſily ſee the faults of others. Moſt of the ſubjects will be conſidered under four different heads.

1ſt, The knowledge of the ſubject in itſelf, and the diſtinction of it from every other.

2d, Its virtues in diet or in medicine.

3d, The foundation of theſe virtues, ſo far as it can be perceived in the ſenſible or chemical qualities of the ſubject.

4th, Its pharmaceutical treatment, and other circumſtances neceſſary to its application in medicine or diet.

With reſpect to the *firſt* head. The ſubjects are of two kinds, as immediately produced by nature, or as farther prepared by art. The knowledge of the *firſt* is to be got by the ſtudy of Natural Hiſtory; the knowledge of the *ſecond*, by an acquaintance with the arts which have been employed on them. Under the *ſecond* head, the virtues ſhall be delivered, firſt, according to the ſeveral general indications, and then as more eſpecially applicable to particular diſeaſes. Here we muſt obſerve, that there is no very good foundation for many

of the virtues which are aſcribed to medicines by the writers on the Materia Medica. The doctrine of Signatures, the fancies of Aſtrology, and the miſtaken application of Chemiſtry, have very much corrupted this part of ſcience. Even what is pretended to be drawn from experience, as much of it has proceeded from the errors and prejudices of the ignorant, and much from the falſehood of deſigning men, it is very little to be truſted. The writers, however, on this ſubject, have commonly copied from one another; but I hope I ſhall be pardoned if I do not repeat after them; and indeed I ſhall willingly appear rather *pauca ſcire, quam multa opinari.* Under the *third* head, we ſhall find ſtill more uncertainty. The ſenſible qualities of ſubſtances go but a little way towards diſcovering their medical virtues. The *Colour* is a very uncertain guide; the *Smell* goes but a little farther; and it is the *Taſte* only that is of any extenſive application. Sir John Floyer, in his *Phytobaſanos*, was the firſt who proſecuted this ſtudy to any length; and the induſtrious Linnæus has ſince beſtowed ſome attention upon it; but both of them, in ſtraining to form a ſyſtem, have carried the matter too far. The Chemical Analyſis, ſtrictly ſo called, has been found of very little uſe; but the treatment, by the application of different menſtruums, has been of more ſervice, and, by reſolving vegetables into their gummy or reſinous parts, we have been able ſometimes to ſeparate the ſalutary from the pernicious, and the efficacious from the inert parts of many ſubſtances. Under the *fourth* head, we ſhall mention the pharmaceutical treatment which medicines have commonly, or may properly receive, and, therefore, the ſeveral compoſitions they enter into, with ſome other particulars relative to their adminiſtration in diet or medicine.

Of the ſeveral plans of a Materia Medica, that to be found in the treatiſe *De viribus Medicamentorum*, imputed to the celebrated Dr Boerhaave, appears to be one of the beſt. It treats of the ſeveral ſubjects as they occur in the order of the *Methodus Medendi*; and it has premiſed ſome phyſiological doctrines that are neceſſary with reſpect to the whole. I find it neceſſary to follow this part of the plan, eſpecially, as I have ſome peculiar notions on the ſubject, which, as they are not common in our ſchools, it is neceſſary for me to explain.

In the *firſt* place, we adopt the propoſition very well eſtabliſhed, *Medicamentum non agit in Cadaver:* That is to ſay, That the operation

tion of medicines does not depend on the laws of matter and motion, which take place in inanimate bodies, but on a principle which ſubſiſts in living animals only. We inquire therefore after this vital principle. It muſt be connected with the primary and fundamental functions of the animal œconomy; but the functions of the animal œconomy are mutually ſo much the cauſes and effects of each other, and run ſo much in a circle, that it is difficult to chuſe where to begin. Many think the circulation of the blood may be conſidered as the vital principle upon which all the other functions depend; but we muſt trace this to its cauſe in the action of the heart; and this again manifeſtly depends upon a certain power acting in or upon the muſcular fibres of this organ. When we conſider this power, we find it belongs, in common with thoſe of the heart, to every muſcular fibre in the whole body. At the ſame time, we find, that the power of muſcular fibres every where depends upon the nerves; that theſe nerves, for what power they communicate, depend upon their connection with their common origin in the brain and *medulla ſpinalis*; the nerves and muſcular fibres therefore form a ſyſtem, whoſe functions may be conſidered as primary and fundamental in the animal œconomy. The principal part of this nervous ſyſtem is manifeſtly the common origin, which is properly enough conſidered as the *ſenſorium commune*, as the more immediate organ of the ſoul. It is therefore with probability ſuppoſed, that our intellectual part, or the ſoul, is the vital principle of the animal œconomy. With regard to this, there is ſome difference of opinion, which may be ſuppoſed to influence the ſyſtem of phyſic, and particularly the queſtion, Whether our intellectual part depends on a certain conſtitution of matter, or upon an immaterial ſubſtance connected with our material part? We are of the latter opinion, and think it is fully proved, by obſerving, that there are laws of the animal œconomy abſolutely incompatible with the ordinary powers of matter and motion. But, on this ſubject, I refer you entirely to Dr Whytt, who, in his book on the vital and involuntary motions of animals, has put the matter beyond all doubt. I will add only one argument, which is, That the aſſociation of ideas, a very fundamental part of all our intellectual operations, cannot be explained upon any ſuppoſed organization of matter. There is indeed ſomething analogous to it in ſounding ſtrings, that are in a certain proportion to one another; but, if the ſimultaneous motions of our intellectual part depended on ſuch a mechaniſm, we ſhould find, that theſe ſimultaneous motions would

be confined to certain parts, and take place in theſe only; but, of the motions of living animals, any one may be aſſociated with any other; and the aſſociation depends entirely upon the impreſſions producing them being made, and frequently repeated, at the ſame time.

The exiſtence of a *Soul* admitted, we muſt next inquire into the circumſtances of its operating in the ſyſtem. With reſpect to this, we find, That the notion of the ſoul's governing the whole animal functions is very ancient, as we meet with it in the Timaeus of Plato. It has ſince been revived in different ſhapes by Helmont, Wepfer, and Dolæus, and eſpecially by Stahl, who plainly maintains, that the ſoul, as in a great meaſure independent of the body, and as in itſelf a rational being, preſides over and directs moſt of the animal functions. In this he has been followed by many phyſicians in Germany, by Dr Nichols in England, as appears from his diſſertation, intitled *Anima Medica*; and our countryman Dr Porterfield has alſo ſhewn a ſtrong bias to the ſame opinion. We cannot, however, join in this with theſe reſpectable perſons, as we neither find it founded in truth, nor that it can have any good influence on the ſyſtem or practice of phyſic. Although the ſoul is certainly a diſtinct ſubſtance from the body, it appears highly probable, that the ſoul, while connected with the body, ſeldom acts, but in conſequence of motions firſt excited in the latter; and that it is generally true, that *Nihil eſt in intellectu, quod non prius fuerat in ſenſu.* Even our reflex ſenſations ſeem to depend upon certain conditions of the organ of our intellectual functions; and theſe conditions being given, the reflex ſenſations are always neceſſary conſequences of firſt impreſſions. The impoſſibility of a perpetual motion or automaton being demonſtrated with reſpect to matter, this is conſidered as a proof, that the ſeeming automaton in a living animal muſt depend upon a ſoul animating all its motions. That the ſoul is conſtantly neceſſary to the motions of the body, we readily admit; but the argument is puſhed too far, when it is ſuppoſed that theſe motions are ſupported by the power of the ſoul alone; for, it appears, that motions excited by the impulſe of external bodies, are abſolutely neceſſary to that ſupport. Take away all impreſſions on the external ſenſes, and moſt perſons will fall aſleep, and that ſleep would probably continue and end in death, were it not for impreſſions being renewed. The power of the ſoul appears, eſpecially in what are called the voluntary motions; but theſe, properly conſidered, do not ſhow that power exerted in

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an arbitrary manner, or with any attention to the motions of the body. How the Will is determined in all caſes, we do not ſay; but, however determined, it is merely the conception of an end or purpoſe to be executed; and, with this, certain motions of the body are neceſſarily connected, without the ſoul's being conſcious, in many caſes, even of the motions of the limbs produced, and in no caſe of the action of the muſcles which produces theſe motions. Anger makes me Will to give a blow; I make a full inſpiration; I continue it; I bend back my body; I lift up my arm, and ſtretch it to the utmoſt; I cloſe my fiſt, and bring down my arm with force upon the part I would ſtrike; and, with all this, my limbs are ſet in a particular poſition, my eye-brows are knit, my eyes are fixed, and the features of the face are ſet in a particular manner. Of theſe ſeveral motions, the ſoul is very little conſcious, and not at all of the ſeveral muſcles employed. The ſoul is indeed a neceſſary part of theſe motions, but cannot be ſaid to direct and govern them independent of the conditions of the body. This is ſtill more clear with reſpect to the internal, and what are called Involuntary Motions, with which phyſic is more eſpecially concerned. The Stahlians would have us believe, that the increaſed action of the heart and arteries which appears in fevers, does not ariſe from the phyſical power of the cauſe of fevers, but from hence, that the ſoul, perceiving the noxious tendency of ſome matter preſent in the ſyſtem, excites the action of the heart and arteries as a means of expelling ſuch noxious matter. This cannot be proved; and it appears to us more probable, that, analogous to a general law of the ſyſtem, the material cauſe of fevers has a phyſical power of exciting thoſe motions that are fitted to expel it out of the body. In ſhort, whatever ſhare the ſoul may have in ſupporting the motions of the body, we can have no art of phyſic, but in ſo far as we ſuppoſe, that the cauſes operating upon the body act by a phyſical neceſſity; and that, by a knowledge of ſuch cauſes, we can produce certain changes in the ſtate of the matter and organization of the body. We agree therefore with Dr Boerhaave, that, when a medical problem is proſecuted ſo far as to be carried to circumſtances depending upon the connection between the ſoul and body, it may be conſidered as ſolved for all the purpoſes of phyſic. Upon the whole, therefore, we conclude with the ſame celebrated phyſician, that the conſideration of the ſoul is not neceſſary to the ſyſtem of phyſic; Inſt. Med.

Med. Art. 696. And, laying aſide the doctrine of the Stahlians, we return to conſider the animal œconomy under another view.

We have hinted already, that the functions of the *ſenſorium commune* are fundamental in the ſyſtem. It is connected with the extremities of the nerves every where, ſo that, by an impreſſion made upon certain of theſe extremities, a motion is propagated from thence to the ſenſorium; in conſequence of which, a ſenſation ariſes; and, by ſenſations ariſing in the ſenſorium, a motion is propagated from thence to certain extremities connected with muſcular fibres, whereby theſe are excited to contraction. Thoſe parts of the body upon which impreſſions made give occaſion to ſenſation, are ſaid to be ſenſible; and thoſe parts which are excited to motion by impreſſions made upon them, or upon the ſenſorium, are ſaid to be irritable. Now, it is pretty obvious, that moſt of the motions of the body depend upon the action of irritable parts; and as in many caſes the action of theſe parts is only excited in conſequence of ſenſations, or other powers acting on the ſenſorium, it is plain, that moſt of the functions of the body depend upon a communication of motion by means of the nerves. This may be called the Nervous Power; and its nature has been variouſly judged of. It is perhaps not very neceſſary to determine it; but we ſhall venture to ſay, that it is probably a ſubtile elaſtic fluid inherent in the whole medullary fibres of the nervous ſyſtem; and that this is probably the material vital principle of animals. Somewhat analogous to it appears in vegetables, many of which are manifeſtly endowed with irritability. Perhaps it is common to all nature, and only under different modifications by certain conditions of other matter.

The ſenſibility and irritability of the ſyſtem, as depending upon a nervous power, being in general eſtabliſhed, it is of importance to determine, what parts are more eſpecially endowed with theſe properties. Irritability is evident wherever we can diſtinctly obſerve the preſence of muſcular fibres, as in the organs of voluntary motion, in the heart, the bronchiae, and alimentary canal; and in ſome parts, where the muſcular ſtructure is not quite evident, experiment has ſhown the irritability, as in the lymphatic ſyſtem, and in moſt of the excretories. The irritability of theſe laſt appears in every excretion, that of ſweat excepted; for this ſeems eſpecially, or only, promoted by the increaſed action of the heart, while every other is

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by an irritation applied to the excretories themſelves; and not only by applications to the excretories, but alſo by thoſe applied to other parts having a ſympathy with particular glands: Thus, certain ſounds can occaſion an increaſed excretion of ſaliva, and a fractured ſcull increaſes the evacuation of bile. The important queſtion on this ſubject is, Whether the arteries are endowed with irritability? It is alledged by ſome anatomiſts, that what has been called the muſcular coat of the arteries conſiſts only of fibres, ſuch as are in the tendons or ligaments, and which are no where elſe ſenſible or irritable; that, in experiment, the arteries do not appear irritable by mechanical ſtimuli; and though they appear to contract upon the application of ſtrong acids, this is no more than what happens to the veins, and even to the fibres of dead animals. But, on the other hand, it is ſaid, that, if the arteries are ſimple elaſtics, the ſtate of the circulation in every part of the body muſt, for the moſt part, depend upon the action of the heart alone; and, if the impetus of the blood be increaſed in one part only, while the action of the heart continues the ſame, it will be difficult to account for it upon that ſuppoſition. Thus, in bluſhing, the impetus of the blood is increaſed in the veſſels of the face, and in thoſe of the cheeks more particularly. Now, if this depended upon the increaſed action of the heart, the redneſs produced ſhould appear over the whole ſurface of the body; and, if it depended on certain circumſtances in the ſtate of the reſpiration, the effect ſhould appear equally over the whole ſuperior parts; but neither of theſe happen; the effects are truly partial, and they are only to be accounted for by ſuppoſing, that the arteries are endowed with irritability and a muſcular power, which can be increaſed in particular parts of them, while the action of the heart and other arteries continue the ſame as before. Dr Haller endeavoured formerly to account for theſe inequalities in the ſtate of the circulation, by the contraction of the nerves ſurrounding ſeveral arteries; but, perceiving that truly the nerves are endued with no contractility, he has entirely given up that theory.

Having thus pointed out the extent of irritability, and of the effects of a nervous power in the ſyſtem, it is evident, that the laws by which the action of the nervous power is regulated require to be attended to, and ſtudied more carefully than hitherto they have been. We ſhall not attempt to ſupply this at preſent; but ſhall endeavour to do ſomewhat, as particular ſubjects may give occaſion to it.

it. Juſt now we ſhall only make ſome general application of what has been ſaid. *Firſt*, With regard to the ſolids of the body, the ſtate of laxity or rigidity in the ſimple ſolids has had a great ſhare in our modern pathology; and we think that the conſideration is not to be neglected altogether; but, at the ſame time, think, that the laxity or rigidity of the ſimple ſolids being given, it is not readily or occaſionally changed; and that all ſudden and occaſional changes in debility or ſtrength, contractility or flaccidity, are more probably referred to the ſtate of the moving fibres under the influence of the nervous power: *Quam facile mille res turbant.*

Secondly, Every change in the ſtate of the fluids poured out, has been conſidered as depending upon the ſtate of the fluids in the veſſels; and it may be ſo in ſome caſes. But, as it is probable that the ſecreted fluids are chiefly formed in the ſecretory organs, ſo it is certain, that the ſtate of the ſecreted fluids is changed by the relaxation or conſtriction of the ſecretory veſſels; and, therefore, the fluids poured out are more frequently a mark of the ſtate of the moving powers than of the general condition of the fluids. Thus, the urine, which has been ſo long conſidered as a mark of the ſtate of the circulating fluids, is however, for the moſt part, no other than a mark of the ſtate of the ſecretory organ.

The *third*, and only other application we ſhall make of the conſideration of the influence of the nervous ſyſtem, is to obſerve, that, as the whole of the ſenſible and irritable parts have a connection with the ſenſorium, ſo certain parts have a more particular connection with certain others. This connection, ſympathy, or conſent, has been often taken notice of; but not ſo accurately and fully as is to be wiſhed. At preſent I ſhall mention only one inſtance, viz. that of the ſtomach, as it is to be more particularly regarded in accounting for the operation of medicines. Nothing affects the mind more than the ſtate of the ſtomach, and nothing draws the ſtomach into ſympathy more than affections of the mind. This is evident in hypochondriac people, whoſe diſeaſe being chiefly ſeated there, has often grievous effects on the *ſenſorium commune*, or the ſeat of it, the head. This is farther illuſtrated by wounds of the head. Does not, in theſe caſes, the vomiting of bile proceed from conſent between the ſtomach and liver? 2dly, The ſtomach has a conſiderable connection with the viſcera of the thorax, abſtracting from its contiguity or diſtention. In hypochondriac caſes, the heart and lungs are often

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variouſly affected by the ſtomach. Convulſions of the diaphragm are often occaſioned by ſlight irritations of the cardia. Many other morbid ſymptoms might be adduced in proof of the ſame thing, were it neceſſary. 3dly, The ſtomach is connected with the abdominal viſcera, and firſt with the inteſtines; ſecondly, with the other contiguous as well as more diſtant organs. 4thly, This viſcus is connected with the extremities. This I have often experienced in myſelf, by tranſition of the gout, from the feet to the ſtomach, and *vice verſa*. Cold and heat likewiſe applied to the extremities, affect the ſtomach. 5thly, It is connected with the whole ſurface of the body, and ſeemingly with the extreme veſſels every where. This is demonſtrable by many obſervations; *e. g.* no ſooner do ſome aliments reach the ſtomach of *particular* perſons, than ſpots and efflorescences are occaſioned on the ſkin. Van Swieten gives ſuch an inſtance from crabs eyes. I myſelf had a patient labouring under the *malum hypochondriacum*, who was relieved of his complaints by pimples appearing between his thumb and finger, and as immediately *oppreſſed* by their retropulſion, or diſappearing. Vomiting from conſtriction of the cutaneous pores is another inſtance of ſuch ſympathy. Such ſymptoms, therefore, are falſly attributed to acrimony; and in general we conclude, that the ſtomach has a very general conſent with the whole ſyſtem.

Operation of medicines depends ſomewhat on their own nature, but as much on the particular modification of the ſyſtem to which they are applied. Inſtead, therefore, of ſpending time, in examining the different *figure* of the particles of medicine, their ſharpneſs, oilyneſs, &c. it will be more uſeful to ſay ſomewhat on temperaments. Temperament is the general ſtate of the ſyſtem; idioſyncracy the *peculiar* ſtate of a *particular* part. The variety of temperaments is prodigious. The ancients have confined them to four, and we, through a blind attachment to antiquity, have made few farther advancements in this diſtinction. It would be difficult to enumerate all the different temperaments; I ſhall therefore conſider, rather, the ſeveral particulars in the ſyſtem that are apt to be varied in

different conſtitutions, and whoſe varieties conſtitute diverſity of temperaments. Theſe particulars may be reduced to five. 1. The ſtate of the ſimple ſolids. 2. The proportion of the fluids to the ſolids. 3. The ſtate of the fluids. 4. The diſtribution of the fluids; *i. e.* of particular determination to this or that part of the ſyſtem. 5. The ſtate of the nervous power.

1. As to the ſtate of the *ſimple ſolids*, viz. their laxity, or rigidity. Under the firſt is comprehended flaccidity, and debility; under the laſt elaſticity, and ſtrength. It may be doubted, whether theſe ſhould be taken in here, as they are variable in every perſon, and, through the whole courſe of life, growing gradually from lax to rigid, as age encreaſes, and therefore might be ſuppoſed not to affect temperaments. Something, however, depends on the primitive ſtamina, in the formation of temperaments; *e. g.* two children, born at the ſame time, brought up exactly under the ſame management, will differ very conſiderably, as to the ſtate of their ſimple fibres.

Univerſally, Phyſicians have taken their mark of the ſtate of the ſimple ſolids from the hair. In a caſe of laxity the hair is ſoft, and in ſmall quantity. In caſe of rigidity, it is copious, and liable to criſpature and curling. The paler colours are, in general, an indication of laxity; as the black, in all its ſhades, is an evidence of rigidity. Thus, in children, the hair is generally ſoft and pale, and gains, by age, hardneſs, and a darker colour. Another mark of diſtinguiſhing the nature of the ſimple fibres, is the ſoftneſs and hardneſs of the fleſhy parts. When the body is fleſhy, and the muſcles and tendons diſtinctly *marked*, and along with this a conſiderable *ſtrength of ſyſtem*, we infer a rigidity of the ſimple fibres, with a conſiderable exertion of the nervous power. Succulency, for theſe reaſons, muſt be a ſymptom of laxity.

2. The proportion *between ſolids* and *fluids*. There has been nothing ſo much talked of as plethora, and yet it has been commonly confounded with *obeſity* and corpulency. There is, however, a manifeſt *difference*, though difficultly diſtinguiſhed by particular marks, and

and at the ſame time a connection. Plethora implies a greater quantity of fluids *circulating* in the veſſels, diſtinguiſhable by ruddineſs of colour, and a number of veins diſtended over the body. Of obeſity, the greater proportion of it *lies without the laws of circulation.* Hence plethora may cauſe obeſity, as in the plethora, if a greater quantity be ſecreted, and not let off from the body, it will preſs upon the veſſels, and cauſe obeſity. V.

3. *The ſtate of the fluids.* Theſe, in my opinion, might be diſregarded, as they depend on the ſtate of the ſolids and the nouriſhment. But we muſt not diſregard what the Ancients have aſſigned as the cauſe of the different temperaments, which they made to depend on four different humours. This doctrine, however, of the Ancients, is now almoſt entirely neglected. The Chemiſts have delivered nothing clear or preciſe on this head, from the different proportions of oil, earth, ſalt, &c. in the blood. They have even added mercury and iron, as the latter is found in all human blood. But we are not aſſured of other principles, viz. red globules, coagulable lymph, and ſeroſity, which laſt is water impregnated with a ſaline principle. Theſe, I make no doubt, are in different proportions, from the nature of the aliment or diſeaſes. But I do not know how to make uſe of this, at leaſt till we be more fully acquainted with the *nature* and of theſe *proportions*, of these and the proper methods of diſtinguiſhing them, which are at preſent very inaccurate and imperfect; *e. g.* the proportion of red globules is not to be diſtinguiſhed, as their *leſs* or *greater florid colour* more of the whole depends not on their quantity, but on the ſtate of diffuſion. Again, the proportion of coagulable lymph is not even evident from *conſiſtence*, as in perſons where there is the ſame quantity of ſerum, the conſiſtence is different. Ligature on the veſſels, child-bearing, &c. cauſe a different degree of ſeparation of coagulable lymph, &c. ſo that no perſon can make any accurate judgment from appearance of the blood. Denſity is a more certain mark. The blood is denſer in proportion to rigidity of the veſſels, and in the ſame ſpecies in proportion to the age; *e. g.* it is more denſe in cows than calves, &c. Besides those of

The *quantity* of ſaline matter may alſo affect the denſity of the blood, and therefore we cannot poſitively determine whether the fluidity of the blood, in particular caſes, be owing entirely to the pure watery part, as the ſaline principle may contribute conſiderably towards the production of that quality.

4. *Diſtribution of the fluids.* This is different in the ſame perſon, according to his age, owing to a difference in the ſtructure and diſtribution of the veſſels. It ſeems to be neceſſary that the brain ſhould be brought to its ſize quickly; hence the head in a fœtus is much greater in proportion to the other parts, and then conſtitutes one-fifth of the whole; whereas in an adult it does not exceed one-ninth, and, frequently, one-tenth only. After birth, a new determination is given to the circulating fluids; the circulation being ſtopt in the umbilical veſſels, is determined to the iliacs, and hence the growth afterwards of the lower extremities is more remarkable. This accounts for hæmorrhages, &c. which happen in different parts of the body, at different periods of life, *e. g.* bleeding of the noſe in young perſons. Again, if a tall perſon have not hands and feet proportionate to the length of his body, he is liable to diſeaſes. Thus I have ſeen a *phthiſis pulmonalis*, of which this diſproportion was the moſt probable cauſe. Hence if we could aſcertain the proportions of the human body exactly, we might form a notion how diſeaſes might ariſe according to the various deviations from it.

We ſhall now take notice of the different diſtribution into the arterious and venous ſyſtems. The arteries are larger in proportion to the veins in the young than in old ſubjects. Wintringham, jun. finds the denſity of the arterious coats leſs in young than in old people. The arteries, therefore, from being laxer, grow more rigid, and are laxer as nearer to the heart. All this is wiſely ordered; for the arteries being more expoſed to the *action* of the heart, and the fluids, in their moving from a greater to a leſſer diameter, are ſooner rendered rigid, than the veins, in which the power of the heart is weaker, and the fluids move in a contrary manner.

manner. Hence ariſes in young perſons the *arterious*, in old the *venous plethora*, a diſtinction commonly unobſerved, though it gives a conſiderable difference in point of temperament. Arterious plenitude is diſtinguiſhed by the florid complexion, the venous by diſtenſion of veins and paleneſs of the body. This change of plenitude is gradually taking place in all people, though the degree of it is conſiderably varied in different perſons.

We conſider here, very properly, the proportional capacity and force of the heart in regard to the ſyſtem, at different times of life, as alſo the proportion of the lungs to the reſt of the body: For as the ſame quantity of fluids, in a given time, paſſes through them, as through the *whole body*, any large proportion of fluids in the ſyſtem muſt of neceſſity be very ſenſibly felt *there*, and, conſequently, have an effect in the production of temperament. Thus narrow cheſted people are more ſubject than others to hæmoptoë and congeſtion in the lungs.

5. *Different ſtate of the nervous power*, with regard to ſenſibility, irritability, celerity, mobility, and ſtrength. By ſenſibility we mean the different forces of impreſſion neceſſary to move different perſons: By irritability the extent of the ſenſation; *e. g.* two perſons, on taking the ſame doſe of an emetic, will be very differently affected; the one vomiting eaſily, without any farther *extent* of the impreſſion, the other being pretty generally convulſed over the *whole* ſyſtem. Of the difference of ſenſibility we are able to judge but groſsly, as it does not depend entirely on the degree of force impreſſed, but is greatly improveable by cuſtom and practice; *e. g.* there may be two perſons equally ſenſible to the ſmalleſt impreſſions of any ſapid body on the tongue, and yet the one may be able only to diſtinguiſh green tea from bohea in infuſion, while the other cannot only tell when a number of *different ſpecies* of the ſame kind of tea are employed in infuſion, but alſo the different proportion in which the teas are employed. The ſame thing may be illu-

illuſtrated by muſical tones: Thus one perſon may be ſenſible to as ſoft an impreſſion of ſound as another, but, unleſs converſant in muſic, he will not be able to diſtinguiſh a variety of tones. Irritability muſt abſolutely be connected with ſenſibility, as being both excited from the ſame cauſe; the one making us ſenſible of the *ſimple* impreſſion, the other *propagating* the ſenſation over the body. Irritability is often connected with weakneſs of the nervous power; ſenſibility, more remarkably with its ſtrength: Independent of the nervous power, irritability is alſo varied in proportion to greater or leſs tenſion of the moving fibres: The more accurately, therefore, the veſſels are *filled*, the fibres will be more ſtretched, and the irritability greater.

Another particular, in which there may be a difference of the nervous power, is in *mobility* or *celerity*, with which actions are excited. This may be different, even when the ſenſibility and irritability are the ſame, though it is generally connected with them, as mobility is greater in more ſenſible and irritable ſyſtems. Another variation of the nervous power is the *duration of impreſſions*. In ſome the effects of impreſſion are tranſitory, and therefore the body is left open to new. This is called levity. In others theſe effects are longer of *duration*, and the motions excited are more ſteady. Laſtly, the nervous power differs in point of ſtrength. Some have ſuppoſed this to depend entirely on the ſtate of the *ſimple fibres*, and, indeed, I allow, that it is often connected with it. But moſt of the changes of debility and ſtrength are owing to changes in the nervous power. Thus at the invaſion of fevers, where we cannot ſuppoſe any change in the ſtate of the ſimple fibres, we ſee often remarkable debility in performing the functions, connected alſo with an increaſed irritability. Again, in maniac perſons there is often an incredible degree of ſtrength exerted, which we cannot poſſibly conceive to proceed from rigidity of ſimple fibres, ſo ſuddenly produced. This ſtrength of the nervous power is oppoſed to ſenſibility, as appears from a much ſtronger doſe of any medicine being required, to pro-

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duce the ſame effects on the above-mentioned maniac than other perſons. In my opinion it is alſo oppoſed to irritability, though not ſo remarkably, for weakly ſyſtems are, *cæteris paribus*, more irritable. Strength of nervous power is alſo oppoſed to mobility, for the more weakly the ſubject the impreſſions are more tranſitory, whereas in ſtrong people the contrary takes place.

Having thus enumerated the different cauſes of temperament, we ſhall now conſider how theſe cauſes are variouſly combined, in order to form different temperaments. Of particular temperaments, thoſe are moſt ſtrongly marked, which are owing to the different ſtages of life. As changes in the ſyſtem take place very gradually, it were proper to aſſume a middle point, to and from which the ſyſtem is gradually advancing or declining, and at the ſame time to mark the different gradation of decline and advance; but as this would be very difficult, I ſhall only handle the matter groſsly, and point out thoſe ſtages where the moſt remarkable changes occur. Theſe may be reduced to four, Infancy, Youth, Manhood, and Old Age. To begin with theſe, therefore, in their order.

INFANCY.

In Infancy occur remarkably lax ſolids, large proportion of fluids which are watery and bland; large proportion of blood in reſpect to cellular ſubſtances: Head and heart large in proportion to the ſyſtem: Arteries numerous and large in reſpect to the veins: The ſecretory glands have not yet attained to their full bulk, while the conglobate, or lymphatic, are larger than at any other time of life. In the nervous ſyſtem there is exquiſite ſenſibility, without accuracy of perception; remarkable irritability with weakneſs, great mobility, the foundation of a great deal of levity. In general, the nervous ſyſtem is ſtrong, with reſpect to the preſent time of life, but weaker than in a more advanced period.

Secondly.

Secondly. Let us conſider now

YOUTH *approaching near to its* ACMÉ.

Rigidity and *ſtrength* are now greater, but ſtill, with reſpect to the middle point, laxity prevails; a leſs proportion of fluids, with reſpect to the veſſels, but ſtill prevailing humidity; increaſed cellular ſubſtance, on which the growth of the body chiefly depends till the Acmé, and long after; heart leſs in proportion to the ſyſtem than formerly, and more in a ballance with it; the arteries are diminiſhed, in ſome meaſure, with reſpect to the veins, but ſtill exceed them; the whole viſcera are larger, and particularly the lungs, and, as the veſſels are more rigid, conſequently a greater determination of fluids to that organ, which explains the diſeaſes incident to the ſtage of life, hæmoptoiſis, peripneumony, &c. The ſame ſenſibility and irritability continue, perhaps, as before, but the former is more accurate, from the tenſion of the veſſels, and conſequently the fibres. The latter is rather encreaſed, and hence iraſcibility more frequently appears at this period. There is alſo great mobility, but with much leſs levity.

Thirdly. We come to examine the ſtate of

MANHOOD.

It is difficult to fix this period; different perſons attaining their Acmé at different times. I would take the thirty-fifth year for a ſtandard. The ſolids are now tending to exceſs of rigidity, with reſpect to the middle point; the fluids are leſs, in proportion to the ſolids, hence dryneſs begins to take place; the heart is ſmaller, with reſpect to the arteries, and exerts leſs force than formerly; hence ſlower circulation, more copious ſecretion, and obeſity, with conſequent ſucculency. Hitherto little change has happened in the ſtate of the fluids, but now they begin to tend towards acrimony.

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The arteries now become leſs, and the ballance is turned to the ſide of the veins: The ſecretory glands are now increaſed, while the lymphatic veſſels are diminiſhed, as alſo the conglobate glands. Senſibility, irritability, mobility, and conſequently celerity and levity, gradually diminiſh from this time. Till this period the ſtrength has been gradually encreaſing, but is now at its height, and afterwards decays, chiefly on account of the rigidity of every part of the ſyſtem. In infants the muſcles conſiſt of truly muſcular fibres, or with very little tendon; but now the tendinous exceed the muſcular parts, and in proportion perhaps the force is diminiſhed. This ſtate of manhood is very variable as to its period, happening in ſome ſooner, in others later; but from this to fifty, the changes are leſs remarkable than at any other ſtate of life.

Fourthly,

OLD AGE.

When this comes on we cannot aſſign exactly, but when it *does* appear, rigidity is in exceſs. Dryneſs, proceeding from the ſmall proportion of fluids, both in the circulatory veſſels and cellular membrane. Acrimony of the fluids is in exceſs, *perhaps to compenſate for the want of fluidity* in the blood, by diminiſhing its coheſion. Inſtead of an *arterious*, a *venous* plethora obtains. The lymphatic ſyſtem almoſt diſappears. Both from weakneſs of the nervous power, and rigidity of the ſimple ſolids, ſenſibility, irritability and mobility, formerly ſo remarkable, are now greatly diminiſhed.

Thus have we pretty well diſtinguiſhed the four grand ſtages of life, by the changes which are obſerved to take place in the ſyſtem. Theſe different changes do not happen ſo uniformly, but ſome peculiarities are remarkable through the whole of life. Thus each ſex is diſtinguiſhed. In the female, there is greater laxity, with humidity and thinneſs of the fluids, arterious plethora, more ſenſibility, irritability, levity and weakneſs, ſo that in them the character of youth continues longer than in the male. In every perſon

are appearances of a temperament peculiar to himſelf, though the Ancients only took notice of four, and ſome have imagined theſe were deduced from the theories of the four humours, or four cardinal qualities; but it is more probable that they were firſt founded on obſervation, and afterwards adapted to thoſe theories, ſince we find that they have a real exiſtence, and are explicable on the doctrine already delivered. The two that are moſt diſtinctly marked, are the Sanguineous and Melancholic, viz. the temperaments of Youth and Age.

SANGUINEOUS.

Here there is laxity of ſolids, diſcoverable by the ſoftneſs of hair and ſucculency; large ſyſtem of arteries, redundancy of fluids, florid complexion; ſenſibility of the nervous power, eſpecially to pleaſing objects; irritability from the plethora, mobility and levity from lax ſolids. Theſe characters are diſtinctly marked, and they are proved by the diſeaſes incident to this age, as hæmorrhages, fevers, &c. but theſe, as they proceed from a lax ſyſtem, are more eaſily cured.

MELANCHOLIC HABIT.

Here greater rigidity of ſolids occurs, diſcoverable by the hardneſs and criſpature of the hair; ſmall proportion of the fluids, hence dryneſs and leanneſs; ſmaller arteries, hence pale colour; venous plethora, hence turgeſcency of theſe, and lividity; ſenſibility, frequently exquiſite, but with great accuracy; moderate irritability, with remarkable *tenacity* of impreſſions; ſteadineſs in action and ſlowneſs of motion, with great ſtrength; for exceſs of this conſtitution in maniacs gives the moſt extraordinary inſtance of human ſtrength I know. This temperament is moſt diſtinctly marked in old age, and in males. The ſanguineous temperament of youth makes us not diſtinguiſh the melancholic till the decline of life, when it is very evident, from diſeaſes, (of the veins,) hæmorrhoids, apoplexy,

apoplexy, cachexy, obſtructions of the viſcera, particularly of the liver, dropſies, affections of the alimentary canal, chiefly from ſlower and weaker influence of the nervous power. So much for the ſanguineous and melancholic temperament; the other two are not ſo eaſily explained. The Choleric temperament takes place between Youth and Manhood. In the

CHOLERIC,

the diſtribution of the fluids is more exactly ballanced; there is leſs ſenſibility, and leſs obeſity, with more irritability, proceeding from greater tenſion; leſs mobility and levity, and more ſteadineſs in the ſtrength of the nervous power. As to the

PHLEGMATIC:

This temperament cannot be diſtinguiſhed by any characters of age or ſex: It agrees with the ſanguineous in laxity and ſucculency; it differs from that temperament, and the melancholic, by the more exact diſtribution of the fluids. Again, it differs from the ſanguineous, by having leſs ſenſibility, irritability, mobility, and perhaps ſtrength, though ſometimes, indeed, this laſt is found to be great.

Theſe are the *ancient temperaments*, which we have brought in as inſtances of the combinations which might take place. The temperaments, indeed, are much more *various*, and very far from being eaſily marked and reduced to their genera and ſpecies, not only on account of variety of temperaments themſelves, but alſo on account of Idioſyncracy. The whole of this ſubject might be prettily illuſtrated by conſidering the difference of genius, &c. and even morals, to which the different temperaments are liable; but, as this diſquiſition is very ſubtile, and does not properly belong to this place, I ſhall wave it on this occaſion.

To conclude; theſe circumſtances, which we have obſerved to concur chiefly in production of temperaments, were the more neceſſary to be taken notice of, as they give indications in the cure of diſeaſes, and ſo may influence what we have to ſay on the ſubject of medicines; but as we have found that the nervous power alone is capable of conſiderable and ſudden changes, it is to this that our medicines ſhould be chiefly directed; for the ſtate of the ſimple ſolids, the proportion and ſtate of the fluids, and the diſtribution of theſe, we have little in our power. *E. g.* 1. Medicines which act on the ſimple ſolids, cannot propagate far their effects on the ſyſtem. 2. The proportion between the ſolids and fluids is eaſily altered by diet and manner of life, therefore it is not a predominant part of temperament, and ſo medicines can have little effect on it, as the *chief* cauſes of temperament are alſo often the chief cauſes of diſeaſes; often medicines are given to little purpoſe, unleſs directed to their cauſes. 3. As to the ſtate of the fluids, I ſhall treat this more fully afterwards, and ſhall only ſay at preſent, that medicines can have but little effect upon them, and any changes we can produce are by diet, and therefore muſt be ſlow. 4. The diſtribution of the fluids is ſcarcely to be altered, but by the gradual progreſs of life, and therefore is moſt of all out of the reach of medicines. 5. The ſtate of the nervous power, and particularly *irritability*, is what medicines chiefly affect, and being that part of temperament which moſtly modifies their operation, we ſhall inſiſt upon it in particular. Haller, in 2d vol. of the *Elem. Phyſiol.* has treated on Temperaments; I therefore beg you would compare what I have ſaid on this ſubject with his obſervations. We now go on to conſider the influence of Idioſyncraſy and the effects of Cuſtom, as the doctrine of temperaments is every where perplexed and confounded with theſe.

IDIOSYNCRASY.

Idioſyncraſy is a peculiarity of temperament in a particular part of the ſyſtem; *e. g.* Error on the ſide of laxity, or rigidity, or having a larger

larger or leſs proportion of fluids to the ſolids. The ſtate of the fluids alſo is often affected by idioſyncraſy, being different in different conſtitutions, owing, as I believe, to peculiar ferments operating in the ſyſtem: Thus a putrefactive ferment may occaſion a greater alkaleſcency of the fluids even in a perſon who lives on vegetable diet, than in one who feeds on animal food. Idioſyncraſy chiefly ſhews itſelf, by a peculiar ſenſibility or irritability of a particular part, which renders that part ſuſceptible of weak impreſſions of one kind, and not of another; thus I have known a perſon faint at the ſmell of mutton, which we will allow to be a very ſingular idioſyncraſy. No part of the ſyſtem is exempt from idioſyncraſy: It is needleſs to enumerate them all, as you may do it yourſelves by examining the diſeaſes on which they evidently depend. Nothing is more neceſſary than to obſerve, that the operation of medicines is as much or much more connected with idioſyncraſy than with temperament. In ſhort, it has ſuch an effect on the operation of medicines, that we ſhould never give a doſe of any efficacious one, without previouſly examining whether the patient has any ſuch peculiarity, that contraindicates either the medicine itſelf, or its uſual doſe: And if the patient have not yet experienced this medicine, it will be proper, as idioſyncraſy is often hereditary, to enquire if any ſuch have ever affected his parents.

We are next to obſerve, that both temperament and idioſyncraſy may be variouſly affected by *Cuſtom*, inſomuch that by this any temperament may be corrected, confirmed, obliterated, or even a new one induced.

CUSTOM.

Every body knows the effect of Cuſtom, in the moral as well as the natural world, and therefore, without regarding theſe effects, we cannot be ſaid to have fully handled the doctrines of temperaments and idioſyncraſy. Our time will only, however, allow to give the great outlines of this ſubject, which you afterwards may fill

up

up at your leiſure. Cuſtom is the frequent *repetition* of impreſſions on the ſyſtem. Cuſtom is often confounded with habit. *Habit* is only the effect of Cuſtom, as when frequent repetition of impreſſions *has given laws to the ſyſtem*. The effects of cuſtom may be reduced to five heads. 1. On the ſimple ſolids. 2. On organs of ſenſe. 3. On moving power. 4. On the whole nervous power. 5. On the ſyſtem of blood veſſels.

1.

Effects on the ſimple ſolids. Cuſtom determines the degree of flexibility, of which they are capable. By frequently repeated flexion, the ſeveral particles of which theſe ſolids conſiſt, are rendered more ſupple and moveable on each other. A piece of catgut, *e. g.* when upon the ſtretch, and having a weight appended to its middle, will be bended thereby perhaps half an inch; afterwards, by frequent repetitions of the *ſame* weight, or by *increaſing* the weight, the flexibility will be rendered double. The degree of flexibility has a great effect in determining the degree of oſcillation, provided that *elaſticity* is not *affected*; if it go *beyond* this it produces flaccidity. Again, Cuſtom determines the degree of tenſion; for the ſame elaſtic chord that now oſcillates in a certain degree of tenſion, by frequent repetition of theſe oſcillations, it will be ſo far relaxed, that the extenſion muſt be renewed, in order to produce the ſame tenſion, and conſequently the ſame vibrations as at firſt. This appears in many inſtances in the animal œconomy, as when different muſcles concur to give a fixed point, or *tenſion* to each other; and thus a weakly child totters as it walks, but by giving it a weight to carry, and by thus encreaſing the tenſion of the ſyſtem, it walks more ſteadily. In like manner the fullneſs of the ſyſtem gives ſtrength, by *diſtending* the veſſels every where, and ſo giving tenſion; hence a man, by good nouriſhment, from being weak, acquires a great increaſe of ſtrength *in a few days*; and, on the other hand, evacuations *weaken* by *taking* off the tenſion. Theſe are the chief effects of tenſion of the ſyſtem. What I have here ſaid muſt not be *ſtrictly* applied to the ſimple fibres, as, perhaps, it belongs partly to the moving fibres.

2. *Effects*

2.

Effects on the organs of ſenſe. Repetition gives a greater degree of ſenſibility, *in ſo far only* as it renders perception more accurate. Repetition alone gives laſting impreſſions, and thus lays the foundation of memory; for ſingle impreſſions are but retained for a ſhort time, and are ſoon forgot. Thus a perſon, who at preſent has little knowledge of cloths, will, by frequently handling them, acquire a ſkill of diſcerning them, which to others ſeems almoſt impoſſible. Many are apt to miſtake this for a nicer *ſenſibility*, but they are much miſtaken; for it is an univerſal law, that the repetition of impreſſion renders us leſs acute. This is well illuſtrated by the operation of medicines; for all medicines which act on the organs of ſenſe muſt, after ſome time, be increaſed in their doſe, to produce the ſame effects as at firſt. This affords us a rule in practice with regard to theſe medicines; it becoming neceſſary, after a certain time, to change one medicine even for a weaker of the *ſame nature*. Thus medicines, which even have no great apparent force, are found, by long uſe, to deſtroy the ſenſibility of the ſyſtem to other impreſſions. But to this general rule, that, by repetition, the force of impreſſions is more and more diminiſhed, there are ſome exceptions. Thus I have known perſons, by ~~a ſtrong~~ frequent emetics, render their ſtomachs ſo irritable, that one-twentieth of the firſt doſe was ſufficient to produce the ſame effect. This, I believe, oftner takes place when the vomit is repeated *every day*, or *oftner*, as I have ſometimes ſeen; for if the ſame vomit be given at pretty conſiderable *intervals*, the general rule is obſerved to hold good. Thus two contrary effects of habit are to be noted; and it is proper to obſerve, that the greater irritability is more readily produced when the firſt impreſſion is *great*, as in the caſe firſt given of the ſtrong emetic. This may be farther illuſtrated by the effect of fear, which is commonly obſerved to be diminiſhed on repetition, which can only be attributed to cuſtom; while, on the other hand, there are inſtances of perſons, who, having once got a *great* fright, have for ever after continued ſlaves to fears excited by impreſſions of the like kind, however ſlight, which muſt be imputed entirely to *exceſs* of the firſt impreſſion, as has been already obſerved. The determining the force

force of impreſſions from the relation they have to each other, is neceſſary to be taken notice of here. In this manner the *want* of any particular ſenſation becomes uneaſy. Weak ſenſations approaching to this *want* are therefore diſagreeable. Very ſtrong ſenſations are, on the other hand, diſagreeable likewiſe, becauſe pleaſant ſenſations are generally of a *middle force* of impreſſion, though, no doubt, they ſometimes depend on the nature of the impreſſion. The reflex ſenſations of pleaſure and pain are mutually exchangeable by repetition, in conſequence of the force being diminiſhed or augmented. Thus tobacco, certainly at firſt very unpleaſant, by cuſtom is rendered very ſoon agreeable. The pleaſing *middle* impreſſions become at laſt *inſipid* by repetition. Hence the love of novelty. Not only are our ſenſations varied in this manner, but they alſo, in ſome meaſure, depend on *relation*. Thus, according to the ſtate of the body, the ſame thing feels *cold* at one time, and *warm* at another. Pleaſing objects alſo vary in the ſame manner. Much uſe has been made of heat and cold in philoſophy, and many endeavours made to eſtabliſh a poſitive nature in each. What I have now ſaid contributes, among other arguments, to ſhow they are purely *relative*. This leads me to an obſervation I formerly made, that increaſed denſity and rigidity of our fibres *diminiſhes* ſenſibility, which, *cæteris paribus*, is obſervable at all periods of life; ſo that, in this view, *cold* not only operates on our ſyſtem by *repetition*, but alſo by contracting the ſolids and rendering them more rigid: While *heat* has the contrary effect, of encreaſing ſenſibility, by *relaxation*. To this head alſo belongs the aſſociation of ideas, which is the foundation of memory and all our intellectual faculties, and is entirely the effect of cuſtom; its influence even on morals is very great, but the conſideration of it does not properly belong to this place. With regard to the body alſo, theſe aſſociations often take place. *E. g.* A diſagreeable medicine will cauſe a nauſea, or even vomiting, and ever afterwards the ſight of it will produce the ſame effects. We ſhall only make one application of this in the cure of diſeaſes, which very much depends on avoiding irritation. It is neceſſary, therefore, in ſuch caſes, to avoid not only the irritating or exciting cauſe, but alſo

every

every other which have been any way connected with it. Thus when maniacs are ſtrongly affected with the ſight of any one perſon, we muſt not only keep the perſon out of their ſight, but every other, who, being often ſeen with that perſon, might recall him to their remembrance. Again, in producing effects on the body, aſſociations ſeemingly oppoſite are formed, which, through cuſtom, become abſolutely neceſſary, *e. g.* A perſon long accuſtomed to ſleep in the neighbourhood of a great noiſe, is ſo far from being incommoded on that account, that afterwards ſuch noiſe becomes neceſſary to produce ſleep. It will be of uſe to attend to this in practice, for we ought to allow for, however oppoſite it may ſeem at the time, whatever uſually attended the purpoſe we deſigned to effect. Thus, in the inſtance of ſleep, we muſt not exclude noiſe when we want to procure reſt, or any cauſes which may ſeem oppoſite to ſuch an effect, provided cuſtom has rendered them neceſſary.

3.

Effects of Cuſtom on the moving fibres. A certain degree of tenſion is neceſſary to motion, which is to be determined by cuſtom, *e. g.* A Fencer, accuſtomed to one foil, cannot have the ſame ſteadineſs or activity with one heavier or lighter. It is neceſſary alſo that every motion ſhould be performed in the ſame ſituation, or poſture of the body, as the perſon has been *accuſtomed* to employ in that motion. Thus, in any chirurgical operation, a certain poſture is recommended; but if the operator has been accuſtomed to another, ſuch a one, however awkward, becomes neceſſary afterwards to his right performance of that operation.

Cuſtom alſo determines the degree of *oſcillation*, of which the moving fibres are capable. A perſon accuſtomed to ſtrong muſcular exertions is quite incapable of the more delicate. Thus writing is performed by ſmall muſcular contractions; but if a perſon has been accuſtomed to ſtronger motions with theſe muſcles, he will write with much leſs ſteadineſs.

This ſubject of tenſion, formerly attributed to the *ſimple fibres*, is probably more ſtrictly applicable to the moving; for, beſides a tenſion from flexion, there is alſo a tenſion from *irritation* and *ſympathy*; *e. g.* The tenſion of the ſtomach from food, gives tenſion to the whole body. Wine and ſpirituous liquors give tenſion; *e. g.* a perſon that is ſo affected with *tremor* as ſcarcely to hold a glaſs of any of theſe liquors to his head, has no ſooner ſwallowed it, than his whole body becomes *ſteady*, and after the ſyſtem has been *accuſtomed* to ſuch ſtimuli, if they are not applied at the uſual time, the whole body becomes flaccid, and, of conſequence, unſteady in its motions.

Again, cuſtom gives *facility* of motion. This ſeems to proceed from the diſtenſion which the nervous power gives to the moving fibres themſelves. But in whatever manner it is occaſioned, the effect is obvious, for any new or unuſual motion is performed with great difficulty.

We have ſhewn that ſenſation depends on a communication with the *ſenſorium commune*, by means of organs ſufficiently diſtended with nervous influence. We have likewiſe found, that ſenſibility is *diminiſhed* by repetition. I am now to obſerve, that in ſome caſes it may be *encreaſed* by repetition, owing to the nervous power itſelf flowing more eaſily into the part, on account of cuſtom. Attention to a particular object may alſo determine a greater influx into any particular part, and thus the ſenſibility and irritability of that particular part may be increaſed.

But with regard to *facility* of motion, the nervous power, no doubt, flows moſt eaſily into thoſe parts, to which it has been accuſtomed: But facility of motion does not *entirely* depend on this, but in part alſo on the concurrence of the action of a great many muſcles; *e. g.* *Winſlow* has obſerved, that in performing any motion a number of muſcles concur to give a fixed point to thoſe intended *chiefly to act*, as well as to *others* that are to *vary* and *modify* their

their action. This, however, is aſſiſted by repetition, and the freer influx, as, by experience, we know the proper attitude for giving a fixed point, in order to perform any action with facility and ſteadineſs.

Cuſtom gives a ſpontaneous motion alſo, which ſeems to recur at ſtated periods, even when the exciting cauſes are removed. Thus, if the ſtomach has been accuſtomed to vomit from a particular medicine, it will require a much *ſmaller* doſe than at firſt, nay, even the very ſight or *remembrance* of it will be ſufficient to produce the effect; and there are not wanting inſtances of habitual vomiting, from the injudicious adminiſtration of emetics. It is on this account that all ſpaſmodic affections ſo eaſily become habitual, and are ſo difficult of cure, as we muſt not only avoid all the exciting cauſes, even in the ſmalleſt degree, but alſo their aſſociations.

Cuſtom alſo gives *ſtrength* of motion: Strength depends on ſtrong *oſcillations*, a free and *copious influx* of the *nervous power*, and on *denſe ſolids*. But in what manner all theſe circumſtances have been brought about by repetition, has been already explained. The effect of cuſtom, in producing ſtrength, may be thus illuſtrated: A man that begins with lifting a calf, by continuing the ſame practice every day, will be able to lift it when grown to the full ſize of a bull.

All this is of conſiderable importance in the practice of Phyſic, though but too little regarded; for the recovery of weak people, in great meaſure, depends on the uſe of exerciſe, ſuited to their ſtrength, or rather *within* it, frequently repeated and gradually increaſed. Farther, it is neceſſary to obſerve, that Cuſtom regulates the particular celerity with which each motion is to be performed; for a perſon accuſtomed, for a conſiderable time, to one degree of celerity, becomes incapable of a greater; *e. g.* A man accuſtomed to ſlow walking will be out of breath before he can *run*

twenty paces. The *train*, or order, in which our motions are to be performed, is alſo eſtabliſhed by Cuſtom; for if a man hath repeated motions, for a certain time, in any particular order, he cannot afterwards perform them in any other. Cuſtom alſo very frequently *aſſociates* motions and ſenſations: Thus, if a perſon has been in uſe of aſſociating certain ideas with the ordinary ſtimulus, which in health excites urine, without theſe ideas the uſual inclination will ſcarce excite that excretion; and, when theſe occur, will require it even in the abſence of the primary exciting cauſe; *e. g.* It is very ordinary for a perſon to make urine when going to bed, and if he has been, for any length of time, accuſtomed to do ſo, he will ever afterwards make urine at that time, though otherwiſe he would often have no ſuch inclination: By this means ſome ſecretions become, in a manner, ſubject to the will. The ſame may be ſaid of going to ſtool: And this affords us a good rule in the caſe of coſtiveneſs; for by endeavouring to fix a ſtated time for this evacuation, it will afterwards, at ſuch time, more readily return. It is farther remarkable, that motions are inſeparably aſſociated with other motions: This, perhaps, very often proceeds from the neceſſary degree of tenſion, but it alſo often depends merely on Cuſtom, an inſtance of which we have in the uniform motions of our eyes.

On Cuſtom depends the ſtrength and ſteadineſs, perhaps, of all the internal functions, as, *e. g.* the heart, which probably was once under the power of the will*. So much for the power of Cuſtom on the moving fibres.

4.

Effects of Cuſtom on the whole nervous power. We have found that, by Cuſtom, the nervous influence may be determined more eaſily into one part than another, and therefore, as all the parts of

* This ſteadineſs, produced by Cuſtom, ſerves a good purpoſe, as otherwiſe the heart, being under the power of the will, would be too liable to its paſſions.

the

the ſyſtem are ſtrongly connected, the ſenſibility, irritability, and ſtrength of any particular part, may be thus increaſed. Cuſtom alſo has the power of altering the natural temperament, and of inducing a new one. It is alſo in the power of Cuſtom to render motions periodical, and periodically ſpontaneous. An inſtance of this we have in ſleep, which is commonly ſaid to be owing to the nervous power being exhauſted, the neceſſary conſequence of which is ſleep, *i. e.* a reſt of the voluntary motions to favour the recruit of that power: But if this were the caſe, the return of ſleep ſhould be at different times, according as the cauſes which diminiſh the nervous influence operate more or leſs powerfully; whereas the caſe is quite otherwiſe, theſe returns of ſleep being quite regular. This is no leſs remarkable in the appetites, that return at particular periods, independent of every cauſe but Cuſtom. Hunger, *e. g.* is an extremely uneaſy ſenſation, but goes off of itſelf, if the perſon did not take food at the uſual time. The excretions are farther proofs of this, *e. g.* going to ſtool, which, if it depended on any particular irritation, ſhould be at longer or ſhorter intervals, according to the nature of the aliment. There are many other inſtances of this diſpoſition of the nervous influence to periodical motions, as the ſtory of the Idiot of *Stafford*, recorded by Dr. *Plot*, (*Spectator*, N° 447.) who, being accuſtomed to tell the hours of the church clock, as it ſtruck, told them as exactly when it did not ſtrike, by its being out of order. Montaigne tells us of ſome oxen that were employed in a machine for drawing water, who, after making three hundred turns, which was the uſual number, could be ſtimulated by no whip or goad to proceed farther. Infants, alſo, cry for, and expect the breaſt, at thoſe times in which the nurſe has been accuſtomed to give it.

Hence it would appear, that the human œconomy is ſubject to periodical revolutions, and that theſe happen not oftner may be imputed to variety; and this ſeems to be the reaſon why they oftner happen in the body than mind, becauſe that is ſubject to greater variety. We ſee frequent inſtances of this in diſeaſes, and in their criſes;

criſes; intermitting fevers, epilepſies, aſthmas, &c. are examples of periodical affections: And that critical days are not ſo ſtrongly marked in this country as in Greece, and ſome others, may be imputed to the variety and inſtability of our climate, but perhaps ſtill more to the leſs ſenſibility and irritability of our ſyſtem, for the exhibition of medicine has little effect in diſturbing the criſes, though it be commonly aſſigned as a cauſe.

We are likewiſe ſubject to many habits independent of ourſelves, as from the revolutions of the celeſtial bodies, particularly the ſun, which determines the body, perhaps, to other daily revolutions beſides ſleeping and waking. There are alſo certain habits depending on the ſeaſons. Our connections, likewiſe, with reſpect to mankind, are means of inducing habits. Thus regularity from aſſociating in buſineſs, induces regular habits both of mind and body.

There are many diſeaſes, which, though they aroſe at firſt from particular cauſes, at laſt continue merely through cuſtom, or habit. Theſe are chiefly of the nervous ſyſtem. We ſhould, therefore, ſtudy to counteract ſuch habits; and accordingly Hippocrates, among other things for the cure of epilepſy, orders an entire change of the manner of life. We likewiſe imitate this in the chincough, which often reſiſts all remedies till the air, diet, and ordinary train of life are changed.

5.

Effects of Cuſtom on the blood-veſſels. From what has been ſaid on the nervous power, the diſtribution of the fluids muſt neceſſarily be variouſly affected by Cuſtom, and with that the diſtribution of the different excretions; for though we make an eſtimate of the proportion of the excretions to one another, according to the climate and ſeaſons, they muſt certainly be very much varied by Cuſtom.

On

On this head I may obſerve, that blood-letting has a manifeſt tendency to increaſe the quantity of the blood; and if this evacuation be repeated at ſtated times, ſuch ſymptoms of repletion, and ſuch motions are excited at theſe times, as render the operation neceſſary. The ſame has been obſerved in ſome ſpontaneous hæmorrhages. Theſe, indeed, at firſt, may have ſome exciting cauſes, but afterwards they ſeem to depend chiefly on Cuſtom. The beſt proof of this is with regard to the menſtrual evacuation. There is certainly ſomething originally in females, that determines that evacuation to monthly periods. Conſtant repetition of this, comes to fix it, independent of ſtrong cauſes, either favouring or preventing repletion; *e. g.* blood-letting will not impede it, nor filling the body induce it: And, indeed, ſo much is this evacuation connected with periodical motions, that it is little in our power to produce any effect by medicines but at thoſe particular times. Thus if we would relax the uterine ſyſtem, and bring back this evacuation when ſuppreſſed, our attempts would be vain and fruitleſs, unleſs given at that time when the menſes ſhould have naturally returned.

MATERIA MEDICA.

HAVING now conſidered the ſubject to be operated upon, *i. e.* ſo much of the animal œconomy as ſeems neceſſary for underſtanding the operation of medicine, we ſhall now proceed to treat of medicines themſelves. I told you I propoſed to range theſe according to the indications in which they are employed. However, the plan given you is not ſo perfect as I could wiſh. But in the courſe of my Lectures I ſhall obſerve its ſeveral errors and imperfections. Theſe miſtakes were unavoidable, conſidering the ſhortneſs of the time allowed to make out my catalogue, which is in moſt of your hands, and though not fit for the public eye, yet, with all its imperfections, I believe it may be to you of conſiderable uſe. Having diſtributed my medicines according to the ſeveral indications, I find myſelf neceſſitated to explain that *term*. An indication is the rule for changing any

any diſeaſe into health. The remedies, by which theſe changes are produced, are called *indicata*, and the ſymptoms, which point out the changes to be produced, the *indicantia*. In diſtributing medicines according to the indications, they muſt be founded on a pathology, or doctrine of diſeaſes. This I have done; but to ſhun diſputes which are unavoidable on ſo dark a ſubject, I have rendered the diviſion very *general*. I have, with the generality of authors, divided medicines into two claſſes, viz. thoſe which act on the *ſolids*, and thoſe which act on the *fluids*. Some have added a third claſs, viz. thoſe which act on both ſolids and fluids. This I have not done, becauſe it often happens that theſe actions are only *ſecondary*, proceeding from their action on the ſolids or fluids. There are, no doubt, medicines which act on *both* ſolids and fluids at the ſame time, as ſalts; but as no medicine whatever is perfectly *ſimple* in its operation, I chuſe to claſs ſuch medicines as ſeem *complex* in their operation, under that head to which their principal action belongs.

Thus far I have explained my general plan of indication. There may, indeed, be ſtarted ſome objections, *e. g.* It may be ſaid, if evacuants, inſtead of acting on the *fluids*, as I have claſſed them in my table, produce their effect by operating on the *ſolids*; I admit the force of this objection, though it appears allowable to take the ultimate effect for the cauſe, and the more ſo as it is conſonant to the uſual ſyſtems. I have made two diviſions of the medicines which act on the ſolids. The firſt comprehends thoſe which act on the *ſimple* fibres, the ſecond thoſe which act on the *moving* fibres, or, as Gaubius calls them, *ſolida viva*. I have ranged the medicines which act on the *ſimple* ſolids according to the diſeaſes to which *they* are liable. My indications here are taken from Boerhaave, who, in his chapter *de morbis fibræ debilis & laxæ*, begins with *nutrientia*, *i. e.* thoſe ſubſtances which afford matter for nouriſhing the weakened fibres. This indication, indeed, is not *ſtrictly* correct, for though in ſome meaſure it is applicable, yet it is not calculated to bring about *ſudden* changes. I now proceed to explain thoſe technical

technical terms which I employ in order that my meaning may afterwards be underſtood. To begin, then.

By *nutrientia*, I mean every thing received by mankind as food. The ſecond indication in laxity comprehends ſuch medicines as increaſe the coheſion of the particles of the ſimple fibres, and ſo render them more denſe. Theſe we have diſtinguiſhed by *aſtringentia*. This term has been uſed more looſely, for every thing that gives ſtrength, and ſtops evacuations that are ſuppoſed to proceed from laxity. In the caſe of rigidity of the ſimple fibres, there are alſo two indications, *viz.* 1. To diminiſh the nutriment or application of new ſubſtance to the ſolid fibre; but of this afterward. The ſecond that is mentioned in the table comprehends emollients, by which I underſtand ſuch medicines as diminiſh the *cohesion* of the ſimple fibres.

We next ſpeak of thoſe medicines which act on the *ſolida viva*. The diſeaſes of the moving fibres are very various, but taking a general view of them, we reduce them to three kinds; 1. Where contractility or motion are *diminiſhed*. 2. Where they are too *ſtrong*, or too much *increaſed*. 3. Where there is *irregularity* of motions. In the firſt caſe, the *ſtimulants* are indicated, *viz.* ſuch medicines as excite more vigorous contractions. 2. Here are indicated the *ſedativa*, by which term I mean thoſe medicines, in whatever manner they act, which diminiſh too great contractility and motion. 3. In this caſe the *antiſpaſmodica* are indicated, under which term, to avoid cavil, I mean ſuch medicines as *compoſe*, or *take off*, irregular motions in our ſyſtem.

Thoſe medicines which act on the fluids, in compliance to general cuſtom, I divide into *alterants* and *evacuants*. By the firſt, I mean medicines which produce changes in the *circulating* fluids, and are reckoned of two kinds, as they operate on the *mixture* or *conſiſtence* of our fluids; though perhaps theſe cannot be ſeparated, as we have already obſerved in the preliminary lectures. With regard to the

conſiſtence of our fluids, they may be too thick, (which property is called lentor and viſcoſity,) or too thin. Remedies for the firſt are called *attenuantia*, for the laſt *inſpiſſantia*. As to mixture we are well acquainted with its variety only in *one* caſe, viz. *acrimony*. There may, indeed, be other faults, but theſe we neglect, as the doctrine of the fluids is very incomplete. Medicines adapted to acrimony are of two kinds. Firſt, thoſe for acrimony in general, the *demulcentia*. The ſecond, are thoſe ſuited to particular kinds of acrimony. Some have entered with great ſubtility in their enquiries into the different kinds of acrimony, but it appears to me, that we are only well acquainted with two ſpecies, which are the ſource of the reſt, viz. the *acid* and *alkaline*. Moſt part of what our own fluids are formed of, either are *originally* or have a *tendency* to become acid in the ſtomach, and, therefore, we may *ſuppoſe* an acid acrimony even ſometimes to enter the ſyſtem, and to prevail there. Medicines which correct this acrimony I have termed *antacid*. Again, it is found to be the conſtant effect of the animal œconomy to convert the acid into an oppoſite acrimony. Some affirm, that this is a perfect alkali, but all agree it is of alkaleſcent nature. The medicines againſt this acrimony I have named *antalkalina*. In the general indication for correcting acrimony, I might have made a diviſion; firſt, into thoſe medicines which correct, and, ſecondly, into thoſe which obviate acrimony. Thoſe that obviate the too great acrimonious alkaleſcency of our fluids I have ſet down under the title of *antiſeptica*.

Having explained the different terms which occurred under the head of *alterantia*, we are now to conſider thoſe under *evacuantia*. By this term we underſtand thoſe medicines which encreaſe the *excretion* of fluids to be thrown out of the body. There may, indeed, be remedies which encreaſe the internal *ſecretions*, but we are as yet unacquainted with them; *e. g.* we have no medicine which will purge the pancreas alone without affecting the inteſtinal glands. In this explanation I ſhall begin *a capite ad calcem*. 1. *Errhina*, which encreaſe the mucus of the noſe; 2. *Sialagoga*; theſe

theſe encreaſe the quantity of the *ſame mucus*, and alſo the ſaliva; in ſhort, whatever is evacuated by the mouth and nearly contiguous fauces. 3. *Expectorantia*, thoſe which encreaſe the *mucus by the bronchia:* I prefer this ſtrict ſenſe to the more general one of whatever is evacuated by the lungs. 4. *Emetica*, thoſe which evacuate the ſtomach. We ſhall not enter nicely into what is to be evacuated; deſiring it to be remembered, that we only mean by emetics whatever evacuates that which may be in the ſtomach. 5. *Cathartica*, thoſe which in the ſame general way evacuate by *ſtool*. 6. *Diuretica*, thoſe which encreaſe the evacuation of urine. 7. *Diaphoretica*, thoſe which evacuate by the ſurface of the body, comprehending the inſenſible perſpiration or more groſs ſweat. All theſe *excretions* depend on *ſecretion*. There is another evacuation in the human body which does not depend on *ſecretion*, viz. the menſtrual flux in women. Medicines which promote this are called *menagoga*, which term is alſo applicable to the hæmorrhoids in men, and the lochiæ in women.

Beſides the terms which I employ, you will find many more in the Writers on *Materia Medica*, which, though often uſed injudiciouſly, are nevertheleſs neceſſary to be underſtood. I ſhall here explain them, and begin with the terms ſynonymous to theſe I have uſed.

I. To *nutrientia* are the terms *reſtaurantia* and *analeptica*, for they are only a ſpecies of *nutrientia*. Writers have extended the meaning farther, and ranked under this head, many I comprehend under medicines: For if ſalep, ſatyrion, &c. be reſtoratives, it is only ſo far as they are *nutritives*. *Linnæus* names *analeptica* thoſe medicines, *quæ vires inſlant*, or which quickly give a certain vigor to the ſyſtem, as wine, &c. but theſe properly belong to the *ſtimulantia*.

II. *Adſtringentia*. 1. *Exſiccantia*; this term ſhould be confined to *external* medicines; for though laxity may depend upon moiſture,

they can only act in external applications, for if there be such internal remedies they must act as astringents. 2. *Indurantia:* This is also a complex term, for they harden, by bringing the fibres closer together, and so are no other than astringents. 3. *Roborantia:* This is also a complex term, comprehending medicines of different classes, as *nutrientia*, &c. but in so far as these medicines act on the simple fibres, they are the same as *adstringentia*. 4. When our fibres are endued with a power necessary to perform the functions, they are said to be in tone; medicines, therefore, which promote this state are called *tonic*, but they act only as astringents. 5. *Sistentia*, or medicines which stop evacutions. These are commonly *astringent:* But this term ought to be rejected, as it leads to an ambiguity. Opium, *e. g.* is a powerful sistent, though it does not act by its astringent quality, but by taking off the sensibility of the fibres, and so diminishing their oscillations.

III. *Emollientia.* 1. *Laxantia:* This is synonymous to *emollientia*, and perhaps the properer of the two, were it not ambiguous, by its being applicable likewise to purgatives of a more gentle kind. 2. *Humectantia:* This term is also synonymous, comprehending such medicines as add moisture to the fibres which is perhaps the chief effect of emollients; but some extend the meaning of *humectantia* farther, to encrease the fluid part of the system in general.

IV. *Stimulantia.* 1. *Calefacientia:* As there is no way of increasing animal heat, but by increasing motion, all the medicines comprehended under this term are really stimulants. 2. *Attrahentia:* This term strictly means all those topical medicines that determine a greater flow of the humours externally; but these, in my opinion, are universally stimulants. The term *attrahentia* comprehends three subdivisions; first, such substances as increase the heat of the part; secondly, those which excite the heat with some degree of inflammation, called *rubefacientia*; thirdly, those which raise blisters, the *vesicantia*, and now frequently *epispastica*, though

though this term more ſtrictly implies *attrahentia*, and is ſynonymous to it.

V. *Sedativa.* I have formerly obſerved, that this is a complex indication: As the ſubſtances which diminiſh motion in the ſyſtem are very various, hence the ſynonimes of *ſedativa* muſt be ſo too; *e. g. Antiphlogiſtic* is a term very generally uſed for ſubſtances which abate inflammation; but, as theſe depend on an increaſed motion, in this ſenſe the term is the ſame as *ſedativa.* Antiphlogiſtics are alſo ſuch medicines as relax the ſolids, deſtroy contractility, or attenuate the fluids; but here the term, being too looſe, ought to be rejected. 2. *Refrigerantia:* This term is more preciſe, meaning ſuch ſubſtances as diminiſh the motion of a particular part, or of the ſyſtem in general. I ſhall not here enquire into the manner in which theſe effects are produced. 3. *Anodyna:* This term ſtrictly means medicines which eaſe pain. It would be difficult to determine whether there is an increaſed motion in every caſe of pain; if ſo, which I think probable, all anodynes are ſedatives. Whatever be in this, anodynes, I may ſay, act firſt either by diminiſhing the motion, or taking off the feeling of the pained part. Of late, anodyne has been confined to medicines which act in this laſt way, and therefore is commonly underſtood to be the ſame with *hypnotica*, or ſuch ſubſtances as induce ſleep, though it would be more proper to make a diſtinction. *Somnifera* and *ſoporifera* are the ſame as *hypnotica*, and all ſynonymous to *ſedativa.* Laſtly, *Paregorica*, which, by the ancient Phyſicians, were conſidered as *ſedativa*, and the ſtrict meaning of the term implies that ſenſe.

VI. *Antiſpaſmodica.* To this term, the only ſynonymous term I know, is *carminative*, which ſtrictly implies ſuch antiſpaſmodics as have the power of taking off ſpaſms depending on intercepted air in the inteſtines.

VII. *At-*

VII. *Attenuantia.* Theſe act either, firſt, by increaſing the quantity of our fluids, or, ſecondly, by diminiſhing the coheſion, the quantity continuing the ſame. 1. *Diluentia:* This term is ſynonymous to the firſt ſignification of *attenuantia*, and diluents only act in proportion to the quantity of water they contain, water being the only diluent: But writers on the *Materia Medica* often, improperly, uſe this term in the ſame general ſenſe as *attenuantia*. 2. *Incidentia:* This is uſed in the ſecond ſignification of *attenuantia*, and is thus called from a ſuppoſed theory, that ſuch ſubſtances break down the fluids as with ſharp edges or points. 3. *Reſolventia* are properly ſuch ſubſtances as give fluidity to portions of our fluids, that had been formerly concreted. Authors, however, uſe this term in the ſame general ſenſe as *attenuantia*, and not without propriety, as the ſame medicines anſwer both intentions.

VIII. *Inſpiſſantia.* 1. *Incraſſantia:* This term is, perhaps, equally proper.

IX. *Demulcentia.* Such ſubſtances as cover and ſheath acrimony, are called demulcents. 1. *Antacria: Materia Medica* writers uſe this term in the ſame ſenſe as I do *demulcents*, but improperly, as this term may imply every medicine which deſtroys acrimony, as *antacida*, &c. and even thoſe which obviate acrimony, as the *antiſeptica*. 2. *Lenientia:* This has been uſed for *emollientia*, but it is properly ſynonymous to *demulcentia*. Other terms have been introduced from theories, *e. g.* Acrimony has been ſuppoſed to depend on angular pointed ſpiculæ, hence *obtundentia*, and *obvolventia*, which mean ſuch medicines as break off and ſheath theſe ſpiculæ: But theſe terms ſhould be avoided, as this theory is neither clear nor well founded. Again, it has been ſuppoſed that acrimony depends on the too great prevalency of any of the component parts of the blood, and thoſe medicines which brought it back to its own natural ſtate, which they ſuppoſed always to be bland, were called *temperantia*.

X. *Antacida.*

X. *Antacida.* Boerhaave has divided this claſs into *abſorbentia* and *immutantia*; by the firſt, ſuppoſing ſuch ſubſtances as took the acid into their pores without changing its nature; and by the laſt, thoſe which did. But we now know that nothing abſorbs an acid, without a *tertium quid* reſulting. In the firſt intention, abſorbent earths can only be uſed; in the laſt, alkaline ſalts.

XI. *Antalkalina.* This term has no ſynonymes.

XII. *Antiſeptica.* I know no ſynonymous term to this but *condientia*, employed by De Gorter. By *antiſeptics*, we mean ſuch medicines as obviate the too great putreſcency of our fluids; but *condientia* extends farther, implying ſuch medicines as, without obviating any particular changes, keep the fluids in their preſent ſtate. But the fluid circulating in our veſſels being ſubject only to putreſcency, I cannot ſuppoſe that any ſuch medicines, of that kind, exiſt, except they are antiſeptics.

XIII. *Errhina.* Synonymous to this term is *ptarmica* and *ſternutatoria.*

XIV. *Sialagoga.* To this is ſynonymous the αποφλεγματιζοντα, which is likewiſe ſynonymous to *errhina.* It is needleſs to inſiſt more upon theſe terms, as they are plain from the very etymology; and, for the ſame reaſon, we ſhall paſs over thoſe that follow in the catalogue.

I ſhall next take notice of ſuch terms as have been employed by other *Materia Medica* writers, and are vaſtly too complex to give a diſtinct idea of the indications they are intended to anſwer.

Many diſeaſes have been ſuppoſed to proceed from obſtruction, and ſo the cure of the diſeaſes muſt be effected by removing that obſtruction: Hence the terms *aperientia, deobſtruentia, deoppilantia. Aperientia* has been uſed, in a more vague ſenſe, for every medicine which, in whatever manner, diſſolves obſtruction; and alſo for ſuch

ſuch as increaſe ſecretions, though no obſtruction ſubſiſts. *Deoppilantia* has a more ſtrict alluſion to the nature of the obſtruction, as when it proceeds from ſomething ſtuffing up the veſſels. But none of theſe terms convey any ſtrict meaning, as they do not explain the manner of their action. The ſtudent, therefore, ought not to be ſatisfied, till he has carefully evolved them, and reduced the medicines, which have theſe terms applied to them, to their moſt ſimple action.

We now proceed to the terms employed in Chirurgical indications; and firſt, of thoſe in cure of tumors. Here the firſt indication is to diſcuſs or reſolve; hence the terms *diſcutientia* and *reſolventia*. Although I do not deny the ultimate effect of theſe, yet the terms are too complex, as comprehending medicines very various in their operations, as *emollientia*, *antiſpaſmodica*, &c. *Reprimentia*, *repercutientia*, *repellentia*, are all ſuppoſed, by many, ſynonymous to *aſtringentia*, but they are too various in their operation to come under any one head; for though *ſacch. ſaturni*, oak bark, and opium, be all repellents, yet their manner of operation is very different. When a tumor can neither be repelled nor diſcuſſed, our next indication is to attempt ſuppuration, which has given riſe to the terms *ſuppurantia* and *maturantia*. Theſe terms are too general, and we ought to conſider in what manner they bring about their effects, whether by operating on the ſolids, or increaſing the putreſcency of the fluids, and then give them names according to their moſt ſimple operation.

Suppuration being brought on, our next intention is to produce, or continue, good pus: Hence the term *digeſtiva*, which is equally complex with the former, and therefore ought to be ſtudiouſly evolved. Digeſtion often depends on keeping up a proper degree of inflammatory motion in the part, and frequently alſo on removing fungoſities. *Detergentia*, *abſtergentia*, *mundificantia*, *depurantia*, are ſynonymous terms. *Detergentia* and *abſtergentia* have been transferred to internal remedies, and applied to ſuch as have the power

power of waſhing off, or deſtroying viſcidities adhering to the veſſels, and carrying them off from the body; and therefore, in this ſenſe, if there be any ſuch, they are no other than *attenuantia*. *Depurantia* have been defined ſuch medicines as cleanſe the body, by promoting the excretion of the degenerated fluids; therefore, in this ſenſe, they are ſynonymous to aperients and attenuants.

The next indication commonly laid down by Chirurgical Writers, in the caſe of ulcers, is to renew the ſubſtance, and they called medicines for this intention *ſarcotica*. This indication is entirely imaginary, unleſs in ſo far as it is applied to medicines which remove obſtacles to Nature's performing the operation, and therefore are nothing but detergents or abſtergents. Another indication laid down by Surgeons, is to agglutinate or conſolidate; hence *agglutinantia* and *conſolidantia*, as though theſe medicines united the parts to which they are applied. But this indication is equally imaginary with the former, being entirely the work of nature; therefore bandages are the only applications which can aſſiſt here. Theſe terms, *agglutinantia*, &c. have been transferred to remedies given internally, and are then called *vulneraria*. This indication is likewiſe entirely the work of nature, for I know no agglutinants, and only two medicines which promote ſuppuration, mercury and peruvian bark; and if writers on the *Materia Medica* do mean any thing by vulneraries, it is aſtringents, but they are unfitly called ſo, aſtringents being never proper, nor are they indeed ever employed in ſuch caſes, at leaſt in this country, and if abroad, it is rather in compliance with a rotin practice, and to amuſe the patient.

The laſt indication in the cure of ulcers is to *cicatrize*, or draw a ſkin on the part. The medicines ſuppoſed to anſwer this end are called *epulotics* and *cicatrizers*, but this is entirely an operation of nature, though *charpie* *, or dry powders, may aſſiſt it.

I am to mention ſome terms ariſing from a ſuppoſed ſpecific property in the medicines: Theſe were ſuppoſed of two kinds; I. Such

* Dry lint.

as were ſpecific to a certain part of the ſyſtem; II. To particular diſeaſes. The firſt diviſion has been carried to great exceſs, as there is ſcarce a part of the ſyſtem which has not had a medicine adapted to it; but at firſt ſight this diviſion muſt appear falſe, as there is no diſeaſe of any particular part that is not common to any other part of the ſyſtem. I ſhall now mention the terms of this firſt diviſion in my uſual order, *a capite ad calcem.* 1. *Cephalics:* By theſe are meant ſuch medicines as are ſuited to diſeaſes of the head; but theſe are very various, and often oppoſite in their nature. By this term writers generally mean certain ſubſtances, which, by an agreeable odour and fragrancy, were grateful to the nerves at their origin in the head. If this were the caſe, the term might be admitted: But I ſhall afterwards ſhow, that little virtue depends on the odour; and all thoſe remarkable for their odour are ſtimulants. A term ſynonymous to cephalic, is, 2. *Nervous*; but this is ſtill more ambiguous and extenſive in its ſignification, as comprehending medicines ſuited to all nervous diſeaſes, *e. g.* ſtimulants, ſedatives, antiſpaſmodics. 3. *Ophthalmics* are medicines ſuppoſed to act ſpecifically in diſeaſes of the eyes; but as medicines good for diſeaſes of the eyes are alſo equally efficacious for the ſame diſorders in any other part of the body, this term has no proper meaning. Some medicines, as *euphraſia*, have been extolled as ſpecifics here, but I know they have no title to any pre-eminence. 4. *Pectorals*, *thoracics*, *pulmonics*, *pneumonics*, are all terms applied to medicines ſuited to diſeaſes in the breaſt, but not one of them has a ſpecific virtue; for I imagine thoſe medicines which increaſe the bronchial mucus will alſo promote the ſecretion of mucus in any other part of the body. But writers in general mean, by pectorals, all thoſe medicines which promote or correct the bronchial mucus, two very oppoſite effects, and therefore the terms are confounding. 5. *Cardiacs.* Cordials act in general on the nervous ſyſtem, and not ſpecifically on the heart. 6. *Stomachics.* Many of theſe medicines excite appetite and promote digeſtion, but they are of ſuch different kinds, and to be uſed in ſuch different circumſtances, that no ſuch term ought to be admitted. With regard to the other abdominal viſcera,

viſcera, the terms are applied with even leſs propriety than in the former. 7. *Hepatic*. This term ſeems to have no meaning at all, as we cannot conceive any medicine has a ſpecific operation on the liver preferable to any other part of the ſyſtem. If any medicine more directly promoted ſecretion of bile, it might be called hepatic. Some ſuch indeed have been ſuppoſed, but I am not acquainted with them. 8. *Splenetics*. This is ſtill more improper than the former. 9. *Nephritics*. It is poſſible there may be medicines which act more directly on the kidneys, but it is only in ſo far as they are diuretics. Nephritics are appropriated to diſeaſes of the kidneys, but they are here the ſame with demulcents, as they act by defending the kidney from the acrimony of the urine, and ſharp points of the gravel. Nephritics have not only been ſuppoſed to act as diuretics, but alſo to puſh out, and even diſſolve, ſand or gravel; but we know none of this kind but ſuch as are diuretics. 10. *Uterines*. This term is equally exceptionable with any of the former, for I doubt even if the *menagoga* act directly on the uterus. 11. *Aphrodiſiaca*: The medicines which act on the genitals, and ſtimulate to venery. I imagine this alſo a falſe indication; for we know no medicines which do this by their immediate action on thoſe organs. Cantharides have been ſuppoſed to be of this kind, but they act only by being received into the blood, and ſtimulating the bladder, and ſo communicating their effects to the organs of generation. There are other aphrodiſiacs, which are ſuppoſed to increaſe the ſeminal turgeſcency; but theſe are imaginary, for we know none but nutrients, which, by being long detained in the ſyſtem, diſtend all the veſſels, and the ſeminal veſicles alſo. 12. *Antaphrodiſiacs*. I can ſay, with more certainty, that this is an unmeaning indication.

II. We now come to conſider ſpecifics, with regard to particular diſeaſes. Many, diſſatisfied with the reaſonings of dogmatic Phyſicians, have been led into purſuits of ſpecifics: If this could be done with ſucceſs it would certainly be very deſirable; but at this day I know no medicine whoſe action I do not think I can explain by its

anſwering a particular indication, which entirely deſtroys the notions of a ſpecific.

I ſhall content myſelf with barely enumerating, in our uſual order, the terms of ſuch ſuppoſed ſpecifics, what we have already ſaid ſuperſeding a farther explanation: *Anti epileptica, anti maniaca, anti melancholica, anti hypochondriaca, anti catarrhalia, anti phthiſica, anti hectica, anti cachectica, anti dyſenterica, anti icterica, anti ſtrumatica, anti ſcorbutica, anti podagrica, anti venerea, anti febrilia.*

We now proceed to another diviſion of terms ariſing from ſuperſtition or falſe notions.

Anti magica, anti pharmaca, anti toxica, alexeteria, anti galactophora, anti lactifera, or *lactifuga, ebolica, ariſtolochia, abortiva, lithontriptica, catagmatica.* I have put *lithontriptica* in this catalogue, though I allow there are ſome medicines which deſerve that name, as *aq. calcis* and alkaline ſalts; but theſe have been but lately found out, and as the term is uſed in the *Materia Medica* Writers, it is improperly applied.

Thus far have I thought proper to treat of terms, in order to aſſiſt your underſtanding of different Authors, and to guard you againſt their ambiguous and inaccurate expreſſions.

Before proceeding to our immediate buſineſs, we ſhall mention two indications omitted in the catalogue; the firſt, *erodentia*, or medicines which deſtroy the ſimple fibres; ſecondly, *anthelmintica:* This indication is a proper one, as there are medicines which act ſpecifically on worms, but it could not be introduced into my plan.

NUTRI-

NUTRIENTIA.

Perhaps the whole of our ſubject might be divided into *food* and *medicine*. The firſt is implied by the term *nutrientia*, which comprehends every thing uſed by mankind in their daily food, as well the ſubſtances which are ſtrictly nutrient, as thoſe which are employed to *obviate* and *correct* the degeneracy to which the nouriſhment is liable. But more ſtrictly *nutrientia* are ſuch ſubſtances as are fitted by the vital power to be converted into our fluids and ſolids, in order to ſuſtain their growth and repair their daily waſte. Here a queſtion ariſes, whether our ſolids and fluids are formed from one common aliment, or out of a mixed, *i. e.* one containing a principle of nouriſhment ſuited to each. The firſt opinion appears to me the moſt probable.

All aliment differs in two particulars; firſt, as it is already aſſimilated into the animal nature, or requires to be *converted* into it, by a particular proceſs of the animal œconomy. Of the firſt kind are all *animal ſubſtances*, which, if not ſimilar, are nearly ſo to our nature, and require only for that aſſimilation *ſolution* and *mixture*. The ſecond kind comprehends *vegetables*, which muſt undergo ſeveral changes before they can be aſſimilated. But as the nouriſhment of all animals, even of thoſe who live on other animals, can originally be traced to the vegetable kingdom, it is plain that the principle of all nouriſhment is in vegetables, and that, therefore, we ought to begin with theſe.

VEGETABLE ALIMENT.

The firſt queſtion that ariſes here is, What are the vegetables which are peculiarly appropriated for food? Perhaps there is no vegetable but what affords aliment to ſome animal. But I will venture to ſay, that in human aliment a choice is neceſſary, and a diſtinction ought to be made. The firſt diſtinction is, that thoſe vegetables which are of a mild, bland, agreeable taſte, are proper

nouriſhment;

nouriſhment; while thoſe of an acrid, bitter, nauſeous nature are improper. Every body, *en gros*, will allow the truth of this. There are, however, ſeveral *acrid* ſubſtances that we uſe as food, but the mild, the bland, the agreeable, are in the largeſt proportion in every vegetable; whereas the acrid, the bitter, the diſagreeable enter in the leaſt quantity; which laſt, however, may prove nouriſhment, provided our ſyſtem is capable of *ſubduing* their nature. Thus we ſee that ſome animals live on what is poiſonous to others, which ſeems entirely owing to the particular *conformation* of theſe animals. Of all theſe animals the human body is moſt delicate in the choice of its food, and the acrid, bitter, and diſagreeable can never be admitted as aliment. There, however, ſeem ſome exceptions. Thus *celeri* and *endive* are uſed in common food, both ſubſtances of conſiderable acrimony; but you muſt obſerve, that when we uſe them, they are previouſly blanched, which almoſt entirely deprives them of that ſuſpicious tendency. Or if we employ other acrid ſubſtances, we generally, in great meaſure, deprive them of their *acrimony* by boiling. In different countries the ſame plants grow with different degrees of acrimony. Thus garlic here ſeldom enters our food; but in the ſouthern countries, where they grow more mild, they are frequently uſed for that purpoſe. Again, the plant which furniſhes *caſſada*, being very acrimonious, and even poiſonous in its recent ſtate, affords an inſtance of the neceſſity of preparation of acrid ſubſtances even in theſe countries; for by a particular management they allow the acrimonious juice to run off, and the farinaceous nutritious part of it is left behind. Upon the whole, therefore, I maintain, that we uſe no acrid ſubſtances in our food that are not previouſly deprived of their acrimony; or, if we do, they are only employed as *condimenta*. But if the queſtion ſtill remain, if it is ſtill urged, that acrid ſubſtances *are* employed in our food, I alledge they are only ſuch as the human body, by its particular *conformation*, is capable to ſubdue. Here then begins the diviſion of plants into food and medicine, the mild, the bland, the agreeable plants, or their parts, being fit for food; while the acrid, &c. are proper for medicine.

medicine. For this reaſon Linnæus's aphoriſms are well founded, *inſipida & inodora nutriunt, ſapidiora non nutriunt*. The reaſon is very obvious, for unleſs ſubſtances *affect remarkably* our organs of ſenſe, they cannot be ſuppoſed to operate powerfully on our ſyſtem. And this very effect of operating powerfully on our ſyſtem, deſtroys their *expediency* as food. Again, as ſapid and odorous ſubſtances have the power of operating changes in our ſyſtem, they muſt act on the *nervous power*, the part chiefly changeable. The inſipid and bland do, indeed, act on our fluids, but the changes they produce muſt be very *ſlow*.

We ſhall now enquire what part of the mild and bland ſubſtances conſtitutes the *proper* aliment. In general, the more ſweet ſubſtances are all nutritious: Theſe are little known here as food, but in the warmer climates make the greateſt part of it. We have now facts to prove, that ſugar alone is nutritious, and we ſhall afterwards endeavour to prove, that all fruits we uſe are nutritious *only from their ſugar*. Here, the farinaceous ſubſtances are more evidently nutritious, as likewiſe the bland mucilaginous. Theſe two are nearly connected with each other, and both with the *ſaccharine* ſubſtance; for all farinaceous ſubſtances, before maturity, are ſweet, and, after maturity, can be reſtored to their ſweet ſtate by malting. Again, in fruits we obſerve a change from ſweet to farinaceous, which laſt property many of them attain upon maturity; and all farinaceous ſubſtances, when mature, abound in oil; ſo that it appears that the ſaccharine and oily part, blended together, make the mucilaginous and farinaceous matters, *i. e.* the intermediate ſtates between ſugar and oil; ſo that I conclude, that ſugar and oil blended together, and forming the farinaceous ſubſtance, is the nutritious part of vegetables. You will now ſee what I formerly aſſerted, that either oil may enter into the nutritious ſubſtance, or that the nutritious ſubſtance, by animal proceſs, may afford oil.

We are next to conſider on what the difference of nutritious ſubſtances depend. This turns on two heads; 1. On the quantity of nutriment

nutriment each ſubſtance contains; 2. On its being more or leſs eaſily aſſimilated.

1.

This depends on two circumſtances; 1. On their containing the proportion of ſugar, or oil, or both; and that proportion even being given, it may depend alſo on the *texture* of the ſubject, which allows a quantity of nouriſhment more or leſs eaſily to be extracted from it. Thus, *e. g.* if my ſtomach extract from a plant, which contains a leſs proportion of nouriſhment than another, that nouriſhment more *eaſily*, it will compenſate for the quantity. As to the difference, with regard to the quantity of nouriſhment *each ſubject affords*, we refer that till we come to treat of each in particular.

2.

As to more or leſs eaſy aſſimilation. This difference ariſes not only from *quality* of the ſubſtance taken in, but alſo as often from its *relation* to the ſtomach, or ſtate of the animal organs. Nothing is more common, or more ridiculous, than to aſk whether this or that ſubſtance be wholeſome. As to the quantity, indeed, the anſwer might be eaſy; but as to quality it entirely depends on peculiarity of conſtitution. The changes our aliments undergo, are of three kinds; 1. In reſpect of aſſimilation; 2. of ſolution; 3. mixture.

1. Aſſimilation implies a change of the nature of the ſubject, which ſpontaneouſly is inclined to alterations, different from thoſe intended to be wrought by the aſſimilatory proceſs; *e. g.* all vegetables are ſpontaneouſly aceſcent, and as there is nothing of that beyond the *primæ viæ*, it is neceſſary, therefore, that it ſhould be *overcome*. Againſt this it may be objected, that vegetables are both aceſcent and alkaleſcent; but I am ready to prove them all of the firſt nature. Do vegetables then become acid previous to their undergoing any other change? I confeſs this is my opinion, though it is not the common one. For it is ſuppoſed, *e. g.* that in

in the ſtomach of a ſtrong healthy man the food becoming acid, tends directly to the putrefactive fermentation. The arguments adduced in favour of this opinion are, 1. That an acid fermentation cannot be carried on without a conſiderable admiſſion of air, and that the ſtomach, being a *cloſe veſſel*, excludes the acceſs of that fluid; 2. That the heat of the ſtomach is too *great* for the acetous proceſs; and, 3. That the admixture of the ſpontaneouſly putreſcent animal fluids would beſides *obviate* this aceſcency.

As to the firſt objection, the ſtomach is not the cloſe veſſel alledged, for it admits a large quantity of *air* along with the food, &c. Secondly, I have found, by accurate experiments, that the acetous fermentation can be carried on in a heat equal to that of the human body, I believe even it is not free of the vinous; although I confeſs that it will be *difficult* to conduct the proceſs in ſuch degree of heat, yet it may be done, and indeed it always does take place, although *rapidly*, and ſoon terminating in the acetous proceſs. Third, as to this objection, Dr. Pringle, I think, has ſufficiently proved, that the admixture of animal fluids cannot hinder the acetous proceſs, but, on the contrary, that in certain proportion they promote it. None of theſe three circumſtances, therefore, are ſufficient to prevent the ſpontaneous tendency of the vegetable aliment to acidity; and I am certain, from experiments, that the vegetable aliment firſt turns acid in the ſtomach; for every ſtomach, human or brute, is always, on examination, found to have an acid preſent in it. Hence that aceſcency is not a diſeaſe, but a ſtep towards aſſimilation: And if Phyſicians obſerve diſeaſes proceeding from this cauſe, they ought to be attributed to the *ſtate* and *degree* of it. As to the ſtate or condition of it I think, it is this: Whenever the aliment enters into a high vinous fermentation, with copious generation of fixed air, commonly called *gas ſilveſtre*, as of the ſame nature with that produced in the ordinary vinous proceſs, it becomes a *diſeaſe*, and has the power of deſtroying the *mobility* and *contractility* of the moving fibres, and even the tone of the ſtomach itſelf, producing there flatulency and ſpaſm from irre-

gular motions of the nervous power, and, at laſt, ſtupor, lethargy, apoplexy, and death. This happens chiefly from fault of animal organs; for though it appears, by Pringle's experiments, that animal fluids do not prevent fermentation, yet they have the power in their ſound ſtate of moderating the *generation of air*.

When acidity is a diſeaſe, it always depends on the above, and on the *degree* or quantity of it; for although I have ſaid that acidity is neceſſary, yet it ſhould only be of ſuch a degree as afterwards to be overcome by the mixture of the animal fluids. I have yet only mentioned the *organs* as the cauſe of acidity; but it alſo depends on the *quantity* of acid naturally in the vegetable, and its tendency to undergo the vinous fermentation. For the diſeaſe conſiſts not ſo much in acidity as in the *vinous* fermentation. For if we take in vegetable matters, after having undergone the vinous fermentation, their effects are not ſo much to produce flatulency, but depend on the quantity of acid taken in. Hence farinaceous ſubſtances, naturally aceſcent, when leavened, *impede*, though not *prevent*, the generation of flatulencies; and hence the ſame quantity of *vinegar* does not produce equally bad effects, as of vegetable unfermented juices.

Acidity, as a diſeaſe, depends on the aliment; 1. As it contains a large proportion of ſaccharine matter. 2. When to that is joined a freſh acidity, which renders it more liable to ferment. Inſtances of this in the *fructus acido dulces*. 3. When, by a *previous* accident, it is put into a ſtate of active vinous fermentation, and in its fermenting ſtate is taken into the ſtomach, as new wines, ales, &c. Theſe are the *qualities* that are apt to be moſt hurtful in their conſequences. On the contrary, thoſe ſubſtances which have undergone fermentation, are leſs liable to produce bad effects, and only do ſo from their quantity.

In the next place, this morbid tendency in the aliment depends on the ſtate of the body, and chiefly on a weaker action of the ſtomach

ſtomach (for I paſs over the effects of the gaſtric liquors, as we are yet but little acquainted with them, and as theſe effects depend on the ſtate of the ſtomach.) To the more or leſs briſk action of the ſtomach, may likewiſe be referred the greater or leſs quantity of nutritious juice emulged, or ſqueezed out; and alſo in proportion to the weaker ſtate of the ſtomach, the food is longer retained there.

Theſe are the circumſtances which ſhould be in view, with regard to aliments, in different perſons.

When the aliment is puſhed into the *inteſtines*, its aceſcency is more certainly overcome by the addition of the bile, and a ſupply of pancreatic and inteſtinal fluids, analogous to the *ſaliva* and gaſtric liquor; and as the aliment never *reſts* in the inteſtines, it is always expoſed to mixture of new juices. Effects of the bile on the aliment are as yet little known. Vegetable acids change the bile in colour, conſiſtence, and taſte, which laſt is ſweet, and this mixture probably affords a new ſtimulus when the *acidity* prevails; and in this way our vegetable aliment *ſtimulates* the inteſtines, produces purging, and even a greater diſcharge of choler itſelf.

It has been imagined by Phyſicians, that aliments differ in their *effects* on the bile, ſome *encreaſing* its acrimony, &c. but what they have ſaid ſeems to me looſe and inaccurate. Whether there are ſubſtances which have different properties with regard to the bile, I dare not determine, and I think whatever is ſaid by authors on this ſubject may be reduced to the greater or leſs acidity of the aliment.

2. This is all that is neceſſary to be ſaid with regard to the aſſimilation of the aliment; we are next to treat of its *ſolubility*. Solubility always depends on the *more or leſs firm texture* of the ſubject. We are apt to miſtake on this head; for animal ſubſtances, though ſeemingly of more coheſion, are found, by a weight appended, to be of eaſier ſolubility. Solubility, then, is more to be noted in vegetables than animals; thus the huſks of vegetables are of much

more difficult ſolubility than animal ſubſtances of apparently the ſame coheſion. In general, the ſoft, pulpy, &c. vegetable ſubſtances are eaſily ſoluble, and the tough, &c. the contrary, and theſe are alſo the longer retained in the ſtomach. Almoſt all vegetable ſubſtances employed in diet are ſpecifically lighter than water, and conſequently than the gaſtric fluids; hence they will float near the cardia, and cauſe eructations. For ſome hours theſe former ſubſtances give no uneaſineſs, but afterwards begin to operate on the upper orifice of the ſtomach. 2. The ſolubility of our aliment is diverſified according to firmneſs of texture; for, in proportion to the ſolubility, two ſubſtances, containing equal quantity of nouriſhment, give more or leſs of it to the extracting powers, and in proportion to the quantity of nouriſhment extracted, more or leſs fæces are left. Vegetable aliments, *cæteris paribus*, give more fæces.

3. With regard to the *mixture* of the aliment. Whenever the oil and watery parts of our aliment are *naturally* mixed, the ſtomach does little. But commonly this is not the caſe, and the oil and water ſeparate in the ſtomach, and muſt be at leaſt in that viſcus intimately confounded. This previous mixture need little to be regarded in ſtrong ſtomachs, but in weak ones; in this caſe the oil and water ſeparate, the former floating near the upper orifice, and cauſing uneaſy ſymptoms. I have known many perſons whoſe eructations were purely oily, and would flame in the fire, and, indeed, this is the ſtrongeſt proof of a weak ſtomach. Oil is liable to particular changes: Out of the body it checks fermentation, but is apt in weak ſtomachs to turn rancid, and occaſion heart-burn, a diſeaſe more frequent from this than any other cauſe. Not only is the aliment thus diverſified, but the qualities of the food alſo often depend on peculiar ſenſibility of the ſtomach, or idoſyncraſy, which here oftener occur than in any other part of the ſyſtem. *e. g.* With reſpect to honey, though, indeed, I think, ſome reaſon may be given for this, ſuch perſons being often affected with it who are affected with acidity, as honey conſiſts of acid and ſugar, the matter of fermentation. This ſeems to be confirmed by ſuch perſons eating

it

it with impunity, when new, mixed with the comb, or when, by boiling, its air is diſſipated, and its acid more intimately mixed with the ſaccharine part. I am not certain whether this theory be ſound, but though it *be*, it cannot extend to ſpaſmodic ſymptoms, &c. produced by a ſmall bit of egg, crab, &c. which ſymptoms can only be explained from idioſyncraſy. Theſe extraordinary inſtances lead me to ſuſpect the ſenſibility of the ſtomach extends further than is ſuſpected, and may be reckoned the cauſe of different taſtes, &c. The primary cauſe of the ſtomach's ſenſibility ſeems to be, that it may extend this ſenſibility over the ſyſtem.

That the ſtomach is ſenſible to different degrees of ſolubility and mixture, is evident from what has been already ſaid. Thus, a quantity of warm water and oil is almoſt always thrown up. A ſmall quantity of oil itſelf will produce this effect. The different ſenſibility of the ſtomach will determine the ſtay of the food in that organ. Hence peculiar flavours affect this longer or ſhorter ſtay. To all theſe I have to add a peculiar effect of the ſenſibility of the ſtomach, viz. whenever the ſtomach is employed in digeſting the aliment, it ſeems to be an eſtabliſhed law of the animal œconomy, that there is more or leſs fever excited during the time of digeſtion, neceſſary, indeed, in ſome degree, but when it proceeds to a *noxious* one it ought to determine a change of our aliment. Theſe preliminaries being ſettled, I proceed to talk of particular ſubſtances.

With regard to the vegetable aliments, I have thrown them into three diviſions. The firſt comprehends all the different kinds of *nutriment*; the ſecond the *drinks*; the third the *condiments*. Again, I have divided the foods according to the *quantity* of nutriment they afford, ſetting them in the following order, viz. fruits, herbs, roots, ſeeds; thus giving the leaſt nouriſhing firſt, &c. This, however, is not ſtrictly true, as ſome fruits are more nouriſhing than certain herbs, or perhaps roots, &c. but theſe exceptions ſhall be marked as we go along. Fruits are ſubdivided into thoſe we eat *freſh*, or thoſe we eat *dry*, or more concentrated. With regard to the

the *whole*, I have not pretended to enumerate *all* the different kinds of aliment, as they differ in different countries; and as of many of them I have little or no experience: I ſhall, therefore, confine myſelf to thoſe known in this *country*, and from what application may be made to ſuch as occur elſewhere.

In the Catalogue, ſeveral blank ſpaces are left, which ſhews that all thoſe which ſtand *near each other* are of ſimilar virtues and qualities, and differ more or leſs from thoſe which are *ſeparated* from them. Among the vegetables theſe blank ſpaces indicate a natural order among the Botaniſts, which alſo points out ſomewhat of reſemblance in virtue of ſubſtances thus ranked together. The letters *a*, *b*, *c*, *d*, &c. ſignify that ſomewhat of a general title might have been inſerted; *e. g.* at *(a) fructus acido dulces*, *(b) cucurbitacei*, *(c) herbæ eſculentæ*.

As to the firſt head, comprehending the *fructus acido dulces*; they are divided into *recent* and *dried*. Of theſe the firſt diviſion conſtitutes a natural order, called by Linnæus *Drupaceæ*, or the ſtone fruits. The virtues of theſe, and all other recent fruits, depend on four qualities, *acerbity*, *acidity*, *ſweetneſs*, and *difference of texture*. By *acerbity* I mean acidity joined to *auſterity*, or *ſtypticity*; acidity and ſweetneſs are ſimple qualities, though ſometimes joined, as in the *acido dulces*. Theſe different qualities appear in the ſame fruit, according to the progreſs of maturation.

Firſt ACERBITY appears, then more pure *acidity*, and laſtly, *ſweetneſs*. In ſo far as fruits are acerb, they ſhould be rejected from our aliment into the claſs of medicines, where we ſhall ſpeak of them under *aſtringentia*. We ought to obſerve here, however, that acerb fruits are leſs liable to an active fermentation, and have, in ſome meaſure, the effects of acids in ſtimulating the ſtomach and encreaſing appetite. Being of firmer texture they are of leſs eaſy ſolution, apt to be retained longer in the ſtomach, and, though leſs acid themſelves, are more apt to generate a noxious one. They have

have the cooling virtues of acids, but are more to be taken notice of for their aſtringency, by both which qualities they diminiſh the periſtaltic motion of the inteſtines, retard the paſſage of the aliment, and occaſion an accumalation and retention of hardened fæces.

2. ACIDITY. In moderate degree acids are grateful to the ſtomach, and excite appetite. Directly as acid they are refrigerant, *i. e.* they weaken the active power of the animal fibres. This is not inconſiſtent with ſtimulating, which afterwards I ſhall ſhew is often combined with a refrigerant power in one and the ſame ſubject. Again, by weakening the ſtomach, they weaken the whole ſyſtem. The acid of vegetables is never pure, but commonly joined with a ſweet, and therefore in ſtomachs ſo diſpoſed, is apt to produce there an active noxious fermentation.

3. SWEETNESS. This is the only nutritious quality of vegetables, and as ſuch is perfectly innocent, but is liable alſo to bad effects from *ſpontaneous* changes, which depend on its *accompanying acid*, and the *weakneſs* of the animal organs. All theſe have, in the inteſtines, a purgative quality, from the changes they produce on the bile, acerbity as *acid*, and ſweetneſs as *changed* into an acid.

4. TEXTURE. As of more aqueous and tender conſiſtence they are more readily diſſolved, and hence, perhaps, are more liable to fermentation. If of a very compact texture, by ſtaying longer in the ſtomach, they, however, are apt to generate a ſtronger acid.

Theſe are the qualities of fruits; and one may judge from the taſte what nature they will be of, the ſtate of the ſtomach being known. Let us then apply theſe general principles to the ſtone fruits. Theſe are of a ſoft lax texture, and their juices dilute, by which means they are eaſily diſſolved in the ſtomach, and for this reaſon they are apt to be taken in large quantities: As they are

acido

acido dulces, they are apt to ferment, perhaps more ſo than any others, from the quantity ſwallowed; hence they produce a copious acid, which irritating the inteſtines, cauſes diarrhœas and cholera, taking their riſe more frequently from this than any other cauſe. Upon the whole, I endeavour to aſſign virtues in general, and I beg it may always be noticed, I except particular virtues: Thus there are plumbs of firmer texture, and therefore as little liable to ferment as firmer fruits.

Of the four following kinds of fruits, the PLUMB is moſt refrigerant, and liable to ferment and produce *cholera*, *diarrhœa*, &c. The CHERRIES are commonly imagined leſs noxious, but to me there ſeems little difference. The APRICOT is a ſweeter, richer, and leſs noxious fruit. As to the PEACH, I have leſs experience: In thoſe countries where it comes to full maturity, it may be ſafe, on account of the *richneſs* of its juice; but with us, its juice is poor, crude, and watery, its taſte acid, and almoſt acerb, its conſiſtence lax. Here, in general, we may obſerve, that the later fruit is always the richeſt.

The ancients alledged, that the ſtone fruits were diſpoſed to produce fevers, an effect ſeemingly oppoſite to their qualities. This they do by their refrigerating power, and preventing digeſtion; and, perhaps, in thoſe countries, may be the primary exciting cauſe. It is imaginary, that ſtones of fruits, ſwallowed with them, prevent their bad effects, and may ſometimes be noxious, as they have been the foundation of ſtony concretions, eſpecially if ſwallowed unripe, with an acerb cruſt adhering to them; beſides, this ſhould not be confined to cherries, and, were it true, would extend to the other ſtone fruits. Although I have mentioned only a few ſtone fruits, *viz.* ſuch as occur here, they are, if found elſewhere, of nearly the ſame qualities, and to be preſumed of much the ſame virtues.

The next ſet of fruits in the catalogue are APPLES and PEARS, the *Pomaceæ* of Linnæus. Theſe have the common properties of the other fruits, *viz.* being liable to acerbity, acidity, &c. They are leſs

leſs dilute than the ſtone fruit, have a leſs active acid, and ſo are leſs liable to a noxious fermentation; but being of firmer texture, are longer detained in the ſtomach, and ſo produce a noxious acid. Apples are, in general, of a more firm texture, and leſs ſoluble than pears: Some pears, indeed, are firmer than apples, but commonly, when ripe, are more pulpy. The pear alſo is ſpecifically heavier than water, and therefore, ſinking to the bottom of the ſtomach, will be more ſubjected to the periſtaltic motion, and ſooner digeſted; while apples, ſwimming near the top, elude the action, and alſo, by irritating the cardia, produce uneaſy ſymptoms. Again, *pears* have more of ſweetneſs than apples, on account of which they are more nouriſhing, and, from the conjoined acerbity, are leſs liable to active fermentation. Writers on the *Materia Medica* have aſcribed, without foundation, cardiac and pectoral virtues to theſe fruits.

I had an idea of arranging here a natural order, called by Linnæus *Heſperideæ*, which takes in more than are here mentioned; but their acid is ſo pure that they ought to be conſidered as *condimenta*. I have ſet down only the China oranges, which, from their ſweetneſs, are certainly nutritive, but from their acidity they are ſubject to fermentation, and have, beſides, the other qualities of ſtone fruits.

The next mentioned are STRAWBERRIES and RASBERRIES, belonging to the *Senticoſæ* of Linnæus. Theſe are very tender, and therefore eaſily diſſolved, paſſing off before a very active fermentation can take place, which likewiſe is prevented by their *ſweetneſs*, which is greater than in ſtone fruits; on all which accounts they are very innocent.

In claſſing all ſubſtances, after giving thoſe which belong to a natural order, I throw together the miſcellaneous by themſelves, as here; the grapes, currants, gooſeberries.

CURRANTS, with us, may be always conſidered as an acid fruit, conſiderably dilute and very pulpy, when kept clear of the acerb huſk; they have very little ſweetneſs, very little nouriſhment, and are liable to all the bad qualities of ſtone fruits.

GOOSEBERRIES are much ſweeter, more nouriſhing, and more innocent, and without the huſks are very eaſily diſſolved, and readily evacuated, and, on account of their ſweetneſs, are leſs ſubject to active fermentation.

GRAPES are a richer fruit, and preferred for the making of wines, as they contain a great quantity of ſaccharine matter; on which account they alſo are more nutritive than any we have mentioned, perhaps as much as the *dates* and figs afterwards to be taken notice of. In the unripe ſtate they are acerb, in their middle ſtate they are apt to ferment, when perfectly ripe, and taken in a moderate quantity, they are among the innocent fruits.

I ſhall conclude what I have to ſay on the recent fruits, with ſome obſervations of the different method of uſing them. We have already obſerved their effects when uſed freſh. Wherever we employ heat we change their qualities, diſſipate their active acid, and diſpoſe them leſs to ferment. Thus acerb fruits, by the diſſipation of their acid by boiling, &c. are rendered more ſo, and conſequently not ſo liable to a noxious diſpoſition: Hence univerſally, roaſted or boiled fruits are ſafer than freſh. We commonly alſo join them with matters which diſpoſe them leſs to an active fermentation. Thus milk, or, more properly, cream is often uſed, having that effect from its oily nature. We ſhall afterwards ſee what effect acids have in coagulating the milk. We alſo now commonly uſe aromatics, as pepper, which, by ſtimulating and invigorating the ſtomach, by taking off ſpaſms, excited from *gas ſylveſtre*, and by their antiſeptic virtue, enable them to reſiſt fermentation, and prevent their bad effects. Wine is uſed to obviate the bad effects of fruit, but this depends on its ſpirituous part, and therefore pure ſpirit, were it not

otherwiſe

otherwiſe noxious, would be moſt eligible. If wine be uſed it ſhould be ſtrong, and ſuch as has undergone its fermentation, and is ripe and mellow. Another method ſtill of uſing them is with ſugar. This ſurely renders fruit more nutritive; whether it prevents fermentation may be doubted; but, as I have obſerved, that ſweet fruits are ſafeſt, ſo muſt a moderate addition of ſugar to acid fruits; in order to ſupply their want of native ſweet, ſometimes we uſe oily matters, as butter in apple pie. This is a very proper, though leſs uſual addition, from its antifermentative quality. But in a weak ſtomach, where the inquiline humours are in leſs quantity, and leſs ſaponaceous, the oil is apt to ſeparate, and produce ill conſequences, as heart-burn, &c. as we have formerly obſerved.

It has been a queſtion agitated among Phyſicians, whether fruits are ſafer before or after meals. The anſwer of this ſeems to depend on a knowledge of the ſtomach. In a weak ſtomach they are more apt to be noxious when empty, than when diſtended with animal food. Here likewiſe they cannot be taken in ſuch quantity as to hurt. In ſtrong ſtomachs there is little difference; there they would ſeem to promote appetite. In weak ſtomachs, even when full, if taken in too great quantity, they may be very hurtful, by encreaſing the active fermentation of the whole. The ancients alledged, that the mild fruits ſhould be taken before, and the acerb after meals, as being fitter to brace up the ſtomach, and promote digeſtion. And, indeed, if taken in moderate quantity, the rule may hold true.

Upon the whole, if you obſerve the effect of the four qualities, acerbity, &c. you are then in a condition to judge of theſe and any other wherever they occur.

DRY FRUITS.

None are fit, or indeed are ſubjected to this proceſs, except thoſe which abound, in their recent ſtate, with much ſaccharine juice It is true, that fruits of every kind are preſerved, but this is more

for elegance than as a part of food; any of the dried fruits I am to mention, are only ſuch as are nutritive. I have ſaid that ſugar itſelf was nutritive; nay, indeed, the very principle of nouriſhment, of which we have various proofs: Thus the Negroes employed in the ſugar manufacture live almoſt ſolely on this, and fatten exceedingly. Another chief proof is, from the fruits which I am to ſpeak of, which are remarkably fattening, but chiefly in their dried ſtate. Again, birds, in fruit time, when the fruits are ripe, increaſe in fatneſs; and at ſuch time, Dr. Robinſon has obſerved, that their livers are enlarged; whence we ſee how fat people are ſo much ſubject to diſeaſes of the viſcera, eſpecially the liver.

The dried fruits I am to treat of, are the grape, date, and fig. They have the common properties of ripe freſh fruits, but are not joined with ſo powerful an acid, part of it being diſſipated in drying. Hence they are leſs liable to run into active fermentation; but if taken in too great quantities, they will run into that, and the acid produced will have all the bad effects of freſh fruits, in producing *diarrhœæ*, *cholera*, &c.

DRIED GRAPES, RAISINS, CURRANTS.

Of this are two kinds, the *uvæ paſſæ majores*, or raiſin, and the *uvæ paſſæ minores*, or *corinthiacæ*, or currants; theſe laſt have more acid joined to their ſugar, hence more laxative. I do not doubt but ſugar itſelf may ſtimulate the inteſtines, and be a gentle laxative, but its ſtronger effects in purging are to be deduced, from its converſion into an acid. Hence currants are more purgative than raiſins, and thoſe than figs, on account of their acidity; and for this reaſon prunes and currants are nearly ſimilar in their effects. The raiſins will alſo have more or leſs of theſe virtues, in proportion to the quantity of acid they contain.

DATE.

This fruit is now leſs generally known here, but is the common food of a great part of Aſia. Were I to give a botanical account

account of any production, it would be this, as the palm-tree, whence it is produced, is ſo curious in its vegetation, and ſo extenſively uſeful in life; but as I have nothing now to offer on this ſubject, I ſhall omit it, referring you to books where ſuch diſquiſitions are particularly treated. The date is of different kinds: In their beſt ſtate they are a pure ſaccharine fruit, free from acidity, but with conſiderable acerbity. Formerly they were much employed in medicine, but are now juſtly laid aſide for thoſe fruits which contain all their qualities in a greater degree, *viz.*

FIGS.

Theſe are the moſt nouriſhing of the dried fruits; they contain a large portion of ſaccharine matter, united with mucilage. From their containing much ſugar, and from being viſcid and leſs readily perſpired, they are more fit for nouriſhment. They are alſo, from their ſugar and mucilage, uſed as demulcent, as their juice is moſt fit for covering acrimony. The date and raiſin were formerly uſed in this intention: The firſt is now laid aſide, but we retain the raiſin as giving a grateful acidity to the too luſcious taſte of the fig. The fig is alſo nephritic from its demulcent quality. They have been ſaid to produce lice, but there is no foundation for believing this, either from information, or from our experience of them in this country. It is true, that in their native country they make the chief food of the pooreſt people, who are generally dirty, and this may have given riſe to the opinion.

The next claſs we are to mention is the *cucurbitaceæ*, of which many more are uſed in food than thoſe here mentioned, viz. cucumber, melon, and pompion, which are chiefly uſed here.

CUCUMBER.

This is taken in great cities by the lower people as nouriſhment, but by the better ſort is chiefly employed as a refrigerant, or condiment, to accompany animal food. They have a bland inſipid juice, without

without acidity or ſweetneſs, approaching, as appears by their ripening, to a farinaceous matter. When uſed green they have ~~no~~ little nouriſhment, ſo are they only to be uſed in the ſummer ſeaſon and by the ſedentary. Although cucumber is neither ſweet nor acid, yet it is conſiderably aceſcent, and ſo produces flatulency, *cholera*, *diarrhœa*, &c. I apply all theſe to their aceſcent nature, though indeed its coldneſs and flatulency may be encreaſed by the firmneſs of their texture. I have ſeen them diſcharged with little change from the ſtomach, after being detained there for forty-eight hours. By this means, therefore, their acidity is greatly encreaſed. Hence oil and pepper, the condiments commonly employed, are very uſeful to check their fermentation. We have lately uſed another condiment, viz. the ſkin, which is bitter, and may, therefore, ſupply the place of aromatics. But let me obſerve, that the *cucurbitaceæ* have, many of them, a very acrid juice in their ſkin; *e. g.* the colocynth, which is of this kind, into a bitter of which nature it is alledged that the cucumber, by particular management may be converted. Hence it would appear, that, as the bitter in the ſkin of cucumbers is of this kind, it ſhould, therefore, only be uſed when young.

MELONS.

Theſe have the ſame qualities we were juſt now mentioning, but being of a tenderer texture, they are, on this account, leſs hurtful, and, as accompanied with ſugar, are conſequently more eaſily digeſted from its bringing on ſooner a fermentation to haſten their ſolution. All our watery vegetables may be conſidered as diuretics. Cucumbers and melons have been reckoned remarkably, ſo much as to bring on bloody urine. But this ſeems to be without foundation. To me, indeed, they would rather appear to have a contrary effect, by encreaſing the watery part of the urine.

POMPIONS

Are only uſed when boiled, and therefore are more ſafe, as their texture is much looſened; but at beſt they are a weak, inſipid food,

food, except from the dreſſing, and therefore are now neglected. It tends to ſhow their nature, that when well ripened, or when kept long after being cut from the ſtalks, they become mealy and farinaceous, and therefore more nouriſhing, and likewiſe ſafer with reſpect to the effects I ſpoke of.

We now come to the *Herbæ eſculentæ*. (*c*.) *Olera* has been uſed for every thing put into the pot. Linnæus has confined the term *oleraceæ* to a particular order of plants, to which the three firſt in the catalogue belong orache, beet, and ſpinage.

ORACHE.

This is of the coarſeſt texture of the three, inſomuch as to be now hardly known in our gardens.

BEET and SPINACH.

Beet is more tender, but leſs ſo than *ſpinach*, to which both this and the former have almoſt entirely given place. They are all of a watery, inſipid taſte, with little ſaccharine or mucilaginous quality, and therefore are of weak nutriment. On account of their little acidity and looſe texture they are leſs flatulent than ſome of the other *olera*. They are ſaid to be laxative, but as they have little acidity or ſweetneſs, this quality cannot be remarkable. They are, however, aceſcent, and hence, if taken in conſiderable quantity, may prove ſo.

Nothing is more common than the opinion that all theſe *olera* are of a nitrous quality. This was Dioſcorides's opinion, and he has been followed in it by almoſt every ſucceeding Author. But from a ſtrict examination of their eſſential ſalts, I have found no foundation for ſuch an opinion. The effects of all the *olera*, as laxatives, are very dubious. In weak ſtomachs they rather encreaſe coſtiveneſs, having nothing in them to ſtimulate the inteſtines and encreaſe the periſtaltic motion. They are, indeed, the moſt cooling and leaſt irritating of the aliments. What I have ſaid of the beet belongs

longs entirely to the herb, for the root is very ſweet, and, according to Margraaf's experiments, contains a larger proportion of ſugar than any other root he examined. But the nature of this will be better underſtood when we come to ſpeak of roots.

Naſturtium: Theſe belong to an order of plants much uſed in food. Their general character is, that they are remarkably acrid, but not poiſonous; on the contrary, their acrimony is of conſiderable uſe in medicine, and in their bland ſtate, being deprived of this acrimony in boiling, they are uſed in food. Hence I took the general rule, that all our aliment is remarkably bland, and that the acrimonious part has little ſhare in it: Of theſe we only uſe the *braſſica* and turnep as food, the others only as condiment. *Braſſica* is moſt frequent in uſe, and of this there are many varieties, as colewort, cauliflower, brocoli, &c. All theſe are ſenſibly ſweet, and therefore more nutritious than moſt of the herbaceous kind. The diſtinction we make of them depends moſtly on their texture. Formerly we only employed the colewort, which has given place to the more tender ſavoy; and perhaps this laſt will give way to the ſtill tenderer cauliflower. Thoſe of the *braſſica* kind are more flatulent than the *oleraceæ*, as having more of a ſaccharine quality, which enables them to ferment, and, by this means, to produce an acid in the ſtomach. I believe they produce theſe effects in a milder degree, in proportion to the richneſs of their ſweet, and tenderneſs of texture. On this account cabbage is rendered more flatulent, and hence a confirmation of the general rule, that flatulency is moſt owing to firmneſs of texture: Thus cabbage itſelf, when very young, is tenderer, and leſs flatulent, than when full grown.

NASTURTIUM

Is uſed merely as a condiment. Were it not of ſcanty growth, it might enter into our food, for I know that, by boiling, it is deprived of its acrimony, and affords an agreeable green.

LAC-

LACTUCA AGNINA.

This is a ſpecies of valerian: It is an inſipid plant, perhaps from its being early taken up in the ſpring; for in its more advanced ſtate it is ſomewhat bitter, and then approaches, in ſome degree, to the four following. In general, all early plants are either inſipid or remarkably acrid: *Lactuca*, as we uſe it, has the general qualities of the oleraceous plants.

CICHOREUM, DENS LEONIS, ENDIVIA, LACTUCA.

Theſe belong to the *ſemi floſculoſæ*, or *plano petalæ*. They will afterwards be mentioned as medicines, under the ſubdiviſion of *amaro frigida*. Theſe are all lacteſcent plants, and it is almoſt an univerſal rule, that all thoſe which afford a milky juice are remarkably acrid, and many of them poiſonous. This ſet has been excepted, and ſeemingly with reaſon, as we uſe them ſo much in food. But they do not infringe ſo much the general rule as has been imagined: For one ſpecies of them is very narcotic, and all are ſo, in ſome meaſure, when old; for this reaſon we only uſe them when very young, or blanch them, to free them of their acrimony, which is done by depriving them of *light*. When young, they are aceſcent, cooling, flatulent; when old, leſs aceſcent, leſs cooling, leſs flatulent, which, perhaps, may be owing to taking the ſkin along with them. But they are never uſed without a condiment.

CELERI.

This is an *apium*, or *petroſelinum*. It belongs to a ſet of plants often lacteſcent, but, independent of this, they have a poiſonous acrimony, on which account it is blanched, though it is never entirely deprived of its acrimony in this way, but more ſo by boiling, when it acquires a mucilaginous ſweetneſs, and is then uſed in our animal broths, eſpecially in winter, for which ſeaſon it is fitteſt, on account of its acrimony.

ASPARAGUS.

This is an intermediate ſubſtance between root and plant. In its adult ſtate it is remarkably acrid, ſo only eſculent in its firſt ſtage of growth. This ſerves to illuſtrate the different ſtates of plants according to the time of their growth. There are many other plants, which, by age, turn acrid, whoſe firſt ſhoots we might uſe as food, as hops, thiſtles, bardana, &c. but aſparagus is the only one employed at preſent. This is ſomewhat ſweet, more remarkably mucilaginous; from both which qualities it is manifeſtly nutritive, and more ſo than any of the *olera* mentioned; alſo on account of its mucilaginous juice, though it be aceſcent, yet it is leſs flatulent than ſome of them. It has often been ſuppoſed, even as we eat it, of very active parts: Theſe, however, appear to conſtitute a peculiar acrimony, quite diſtinct from the nutritious matter, and which ſeems to give the ſmell which is perceptible in the urine of perſons who uſe it.

CINARA, ARTICHOAK.

The part in uſe is of a nature ſomewhat between herb and fruit, and is the receptacle of the flower and ſeed. Artichoaks came early into uſe in Europe, and came into England about Henry the Eighth's time, and then were conſidered as the rareſt delicacy, and ſold at much the ſame price as pine-apples now. When thus rare, many qualities were attributed to it. Among the reſt it was called aphrodiſiac, but without foundation. In ſouthern climates artichoaks are eat raw, as ſallad, with oil and pepper; but this practice is only fit for warm climates. In this country we uſe them boiled; and, if young, they are of a tender texture, and eaſily diſſolved. They are little aceſcent, ſo not flatulent. The taſte of artichoaks is ſweet, which beſpeaks them remarkably nutritious.

FUNGI.

Next to the herbs, I have ſet down theſe. Theſe are, indeed, herbs only in ſo far as ſome of them are above ground; but they differ ſo much from every other herb and even vegetables, and beſides their virtues are ſo different, as to make it very difficult to claſs them. Of the fungi, three diſtinctions are to be noticed, Truffle, Morelle, and Muſhroom, which take in the other fungi.

TRUFFLE.

This is as ſingular in its qualities as vegetation. It never riſes above ground, nor ſeeds, but ſhoots in the earth, being a ſingle ſolitary ball, ſomewhat firmer than muſhroom. In this country they are never found, ſcarcely in England. From Geoffroy I learn that it is not aceſcent, but yields at firſt a volatile alkali, which ſhows it approaches near to the animal nature. Hence its qualities may probably be deduced; and for this reaſon it is leſs flatulent, more nouriſhing, and more ſtimulating to the ſyſtem than any other vegetable; and of the great variety of vegetables, commonly ſaid to be poſſeſſed of aphrodiſiac virtues, is perhaps the only one which has any title to them. In thoſe countries where it is uſed it is never found noxious or poiſonous as the muſhrooms. It has been alledged, that on account of its firm texture it may be of ſlow ſolution, and ſo difficult to digeſt.

MORELLE.

This belongs to a genus, called by Linnæus *phallus*. There are two ſpecies, viz. the one here mentioned, which is not indigenous, and another remarkably fœtid, growing about hedges, the *phallus fœtidus penis imaginem referens*. It is of a porous cellular texture, not laminated as the muſhroom. The morelle has been ſaid to approach in qualities to the truffle, but I conſider it more as a faſhionable ornament to our diſhes, than as any proper food.

MUSHROOMS.

Phyſicians have diſputed much about the qualities of theſe, ſome conſidering them as a rich nouriſhment and perfectly innocent when properly choſen, others aſſerting them to be extremely deleterious; moſt of the fungi are indeed of a hurtful quality, and with reſpect to the whole tribe the eſculent are very few. Eſculent muſhrooms are very nutritive, very readily alcaleſcent, and more ſo without intermediate aceſcency than any other vegetable; therefore a rich nouriſhment, and much akin to animal food; on which account they may be indulged in conſiderable quantity to ſtrong perſons. It requires, however, ſkill to diſtinguiſh this eſculent kind; and very few have ſtudied Cluſius, or other authors, who have been at the pains to diſtinguiſh them, eſpecially thoſe, viz. the ſervants who are employed to gather them. Perhaps our eſculent muſhrooms, if old, acquire a dangerous acrimony; wherefore, as expoſed to all theſe accidents, I think it may be prudent for the moſt part to avoid them. In the warmer climates, they may be uſed as a light kind of food, but here it is prepoſterous to uſe them along with animal food, as they do not correct its alkaline tendency.

ESCULENT ROOTS.

Radiſh, Turnep. Theſe belong to the *ſiliquoſæ*, which we mentioned, under *naſturtium* and *braſſica*, to be an acrid claſs, but never poiſonous, and often good in medicine. This acrimony has given riſe to particular opinions, ſome aſſerting that they are cooling, while others call them alkaleſcent. Both, however, ſeem to miſtake. Their acrimony is diuretic and diaphoretic, and ſo diſcharges all the parts of the blood which have degenerated to an alkaline acrimony. On the other hand, I have ſaid that all plants are *aceſcent*, and I except only the fungi. Perhaps, indeed, the *ſiliquoſæ* do run on quicker to putrefaction, but this is only a difference in degree, and not in quality. Thus far of the *ſiliquoſæ* in general.

RADISH.

RADISH.

This, as being ſo acrid, is uſed only as ſallad or condiment. When boiled it becomes mild, and were it not for its ſlender ſtate when young, and for the difficulty of depriving it of its acrid ſkin when old, and its toughneſs, it might be uſed this way in the kitchen.

TURNEP.

This is eaſily deprived of its acrid ſkin, and is alſo pretty large, which is the reaſon why it is preferred in our aliment, but is a watery weak nutriment, very flatulent, and purgative in conſequence of its aceſcency.

SCORZONERA, TRAGOPOGON.

Theſe belong to the *ſemifloſculoſæ*. The roots are remarkably free from the acrimony which appears in the plant above ground, and of what acrimony they have, they can eaſily be deprived, by boiling. They are ſweeter than turnep, and therefore leſs aceſcent and leſs flatulent, but yield to the three following:

CARROT, PARSNIP, and SKIRRET.

Skirret is remarkable for being a plant from whoſe root Margraaf, of all the plants he tried, extracted moſt grained ſugar, except the red beet. The carrot yields a conſiderable quantity of rich ſaccharine matter, in the form of ſyrup. From the parſnips, a ſmall quantity of grained ſugar, and a large one of ſyrup, is extracted, very viſcid, with a copious mucilage. From the ſweet mucilaginous matter contained in all, they are conſiderably nutritious. The quantity of nouriſhment is leaſt in the ſkirret, and greateſt in the parſnip, from different mixture in each of the ſaccharine and mucilaginous matter. In the ſkirret, the ſaccharine fermentable matter is moſt open, and therefore this, of the three, is moſt aceſcent and flatulent.

flatulent. All three are taken from a claſs of plants which abound in a deleterious acrimony: Parſnip, from its ranker ſmell and taſte, is moſt ſuſpected and moſt ſhunned. And here I may obſerve, that the bland nutritious vegetables are agreeable to all, but in thoſe of a mixed or ſuſpicious kind we ſee many idioſyncraſies. It is ſaid that parſnips, when old, turn very acrid, inſomuch as to have produced mania and other dreadful effects: When old, they are called madnips by the Engliſh. Theſe effects, perhaps, might have proceeded from taking hemlock, or others of the umbelliferous kind, by miſtake.

LEEK, ONION, GARLICK.

Theſe belong to the alliaceous kind, and are all ſpecies of one genus. In their recent ſtate they are acrid, but harmleſs to the human body: When, by age or climate, this acrimony is too great, we do not uſe them as food. In Spain, the garlic being equally mild with the onion, is uſed as common food. By the ordinary culinary preparation, their acrimony is diſſipated, and a remarkably mild ſubſtance remains, promiſing much nutriment, which thoſe who can digeſt them raw will certainly obtain. Though ſometimes ſhunned as food, yet, on that account, they are employed in medicine, uniting the two qualities of pectorals, *viz.* on the account of their acrimony, being, in their recent ſtate, expectorant; in their boiled, on account of their mucilage, demulcent, provided the quantity taken be ſufficient. Some of late, in this country, have found in the leek a ſomniferous quality; but this is not yet confirmed by a ſufficient number of experiments.

Beſides the three here mentioned, there are ſeveral others, belonging to the ſame tribe, that we uſe as condiments, but only the leek and onion as diet. In its recent ſtate the onion is moſt acrid, in its boiled one the leek retains its acrimony moſt tenaciouſly. On account of this, and ſome difference of texture, the onion is more eaſily digeſted, and more univerſally uſed than the leek, being more eaſily broke down, and more generally agreeable.

PO-

POTATOE.

This is an intermediate ſubſtance, between eſculent roots and farinaceous ſeeds, and is now of frequent uſe, being of eaſy culture and plentiful product. Some have alledged it has bad qualities, but experience ſhows the contrary; as aceſcent indeed, it may be flatulent, but as it approaches more to the farinaceous ſeeds, it is leſs flatulent, and more nouriſhing, than any of the oleraceous herbs or roots I know: That they are farinaceous there are many proofs, as they can be applied to all the purpoſes of the farinaceous ſeeds, as for making ſtarch, vinous liquors, *&c.* Though this plant belong to the genus of night-ſhade, and though the ſeeds retain the acrimony of that genus, yet the root is found to have no ſuch qualities, being, in my opinion, of the moſt innocent and ſafeſt nutriment. Hence then it would appear, that the rule of plants of the ſame genus having the ſame virtues, is not ſo general as is commonly imagined: This, indeed, is ſo far from being true, that different parts of the ſame plant have often different virtues.

SALEP.

This is a preparation of the root of the *orchis*, which grows plentifully in Turky and Perſia. The *orchis* of this country ſeems to be of much the ſame nature, though not ſo convenient, as it does not grow to the ſame bulk. The method of preparing ſalep is as follows, and given us by Geoffroy: Firſt, they throw the roots into water, in order to free them of the ſkin. My author does not mention whether the water ſhould be cold or hot; in my opinion the latter would be preferable; it is afterwards boiled in water, till, I fancy, it is perfectly ſoaked with it; the water is then drained off, and the root hung up on threads to dry, till it has acquired a gummy or reſinous appearance. In England, it is ſaid to be imported in this form; but here we commonly have it in a powder. Thrown into water it melts into a mucilage, of a ſmooth taſte, ſomewhat ſweet. Both from taſte and mucilage, it is plainly of a farinaceous matter,

and

and is liable to the ſame inconveniencies, aceſcency and fermentation, eſpecially aceſcency. It is extremely convenient for affording an extemporaneous mucilaginous drink, but, as we uſe it, it is too weak a nutriment. Hence I have no faith in its aphrodiſiac virtues; but it is very fit, where acrimony abounds in the *primæ viæ*, as in dyſenteries, as we find confirmed by Degner, on that ſubject.

Many other roots, of the farinaceous kind, might be mentioned here. Several of theſe roots are, in their recent ſtate, remarkably acrid, as the caſſada of Surinam already mentioned. In the ſame manner the Laplanders uſe a plant of the like qualities, which affords a mealy matter, with the ſame management. In this country the *arum* ſeems to be of the ſame nature; being, when recent, very acrid, by drying turned mild and farinaceous; and I make no doubt but it might be uſed as a farinaceous ſubſtance in food. I know one purpoſe which it ſerves in common with other *farinæ*, *viz.* making a fine powder for the hair.

SAGO.

It is the product of a ſpecies of oriental palm, called *todapanna*, &c. We have long been acquainted with the ſubſtance, but often have diſputed about its origin. We are now aſſured, that it is the pith of the tree above mentioned. When the tree is cut down, the pith is ſeparated from its filamentous membrane, and afterwards farther cleaned by winnowing, and broke down into a fine meal, and dried in the ſun. Some ſay that this meal is made into a pulmentum with water, dried, and afterwards formed into the grains in which we have it. This opinion I am apt to favour. Poſſibly, from ſome of our own farinaceous matters, ſome ſuch ſubſtance might be procured. Sago appears to be a pure, mild, bland, farinaceous ſubſtance, having the oil and ſugar intimately blended. Hence its qualities may be underſtood, being demulcent, as other *farinæ*, &c. It diſſolves in water into a viſcid mucilage, and it is owing to its viſcidity that it is leſs aceſcent, and flatulent, than other *farinæ*, keeping longer, even for twenty

twenty years, than other *farinæ*, and alſo in its mucilaginous ſtate a long time. Hence it is conſiderably nutritious, as the Eaſt Indians experience.

FARINACEOUS SEEDS.

Theſe make the chief vegetable nutriment of all nations. They are ſubdivided into three kinds, 1. *Cerealia*; 2. *Leguminoſa*; 3. *Nuces oleoſæ*. The firſt is the pureſt *farina*; the ſecond is more oily; the third ſo much more ſo, as to have their oil ſeparate, and eaſily extracted from them. The *Cerealia* are of moſt univerſal uſe. Thus barley, rye, and oats are the food of the North. In the Southern parts of Aſia, Africa, and America, wheat, rice, and maiz. In the Eaſt Indies they are ſupplied with European corn. To theſe millet may be added. All theſe ſubſtances belong to a diſtinct family of plants, under the name of *Culmiferæ*, or *Graminoſæ*. The whole of the *gramina* are of the ſame nature, and furniſh aliment to men and domeſtic animals. All theſe might be uſed in food, but we employ thoſe of largeſt growth and product. The properties of all are much in common. They are all aceſcent and ſaccharine, or by malting, convertible into a ſaccharine nature. Hence they are the proper ſubjects of fermentation, and hence they are aceſcent, though leſs ſo than any of the vegetables yet mentioned. And here, by the bye, I may obſerve, that in my Catalogue I had in view to place the ſubſtances in the order of aceſcency. To go on; we render them leſs aceſcent by a previous fermentation, as in the form of bread: So much for their aſſimilation. They are not ſo readily ſoluble in the ſtomach as moſt of the vegetables we have mentioned, eſpecially when made into a paſte; but in this form they have an advantage, becoming not only more nouriſhing for the robuſt, but, as I ſhall afterwards obſerve, for all. The firſt appearance of their ſolution, is to give a mucilage; hence they are demulcent. Some call them aſtringent: I ſee no foundation for this, as any appearance of their aſtringency is owing to their demulcent property. So far of theſe ſubſtances in general. We now proceed to ſpeak of each in particular, very briefly.

BARLEY.

This is a ſweeter grain than moſt of the others, its ſugar being leſs covered by the oil; hence it is the more common ſubject of fermentation. It is alſo leſs nouriſhing, not only becauſe the ſugar is leaſt covered, but alſo becauſe it breaks down into a very bulky meal, on which account when made into paſte it is leaſt ſolid food, ſo that barley pottage, &c. makes a leſs ſolid, and therefore a lighter nouriſhment. It is, however, preferable for decoctions, as it renders them leſs viſcid than any of the farinaceous ſubſtances I know.

MILLET.

This, from its ſweetneſs, is manifeſtly of the ſame nature as barley, and if as large a grain, would be uſed for the ſame purpoſes. As tender and ſweet, it is ſometimes uſed in our puddings.

RYE.

This is a ſweet grain, and from accidents, as well as this, it has particular qualities, being in the countries where it is uſed the food of the poor, and therefore not cleaned accurately from its huſks. Hence, and from its ſweetneſs, it is conſiderably aceſcent, ſo more liable to ferment in the ſtomach and produce purging, which people on their firſt uſing it commonly experience.

OATS.

This grain is a ſtronger nutriment than the former, as the ſweetneſs is leſs obvious, the oil being more intimately blended with the ſugar. This appears from more nouriſhment being actually obtained than from the ſame quantity of barley or rye. It is of a more firm and compact texture, and from being leſs ſoluble than the wheat, appears to me the reaſon why it gives leſs nouriſhment. Oats have been ſuppoſed heating, and to produce itch, &c.

It is abſurd to ſuppoſe any heating quality in any of the *farinaceæ*. Heartburn produced from its uſe is given as an inſtance of its heating quality; but this is owing to the aceſcent quality common with other *farinaceæ*, taken unfermented. Even wheat itſelf, made into unleavened cakes, as the oats are commonly here, produces the ſame effects.

WHEAT.

This is a more perfect grain than any yet mentioned, particularly it affords a finer *farina* than oats or barley, for I believe it is ſcarce poſſible to make a ſearce fine enough, in order to hinder its tranſmiſſion. It is the grain of moſt plentiful encreaſe, even in this country, and, in proportion to the quantity, gives a more plentiful nouriſhment. It is certainly the fitteſt for bread of any, I mean the European grains, for I imagine it is excelled by

RICE.

This, both for largeneſs of produce, quantity of nouriſhment, and goodneſs, is more excellent, being of finer *farina* and more tender texture, as is plain by macerating the different grains in water; for as the rice ſwells to largeſt ſize, ſo its parts are more intimately divided. Rice is ſaid to affect the eyes, but this is purely prejudice: Thus it is alledged a particular people of Aſia, who live on this grain, are blind eyed; but if the ſoil be ſandy, and not properly covered with herbage, and as theſe people are much employed in the field, this affection of their eyes may be owing to the ſtrong reflection of the rays of light from this ſandy ſoil; and I am more inclined to this opinion, as no ſuch effect is obſerved in Carolina, where it is very commonly uſed.

MAIZ.

Of this I have but little experience to ſpeak poſitively of it. It is an American grain. It is of a firmer, more ſolid texture than

the reſt; it may, however, be broke down into a fine meal. With water, it forms the moſt gluey viſcid ſubſtance of any of the *farinacea*, therefore ſhould be well opened by fermentation, to make it fit for tender ſtomachs. In our trials we have never been able, when we imported it in times of ſcarcity, to make it undergo ſuch a fermentation as to have the friability of our grains.

BUCK WHEAT.

This is a farinaceous ſeed, but does not belong to the ſame claſs with the former. It is employed as food in this country now very rarely. It is uſed for ſome other purpoſes, particularly to give a thick mucilage, of uſe to give tenacity to yarn in weaving, for which purpoſe it anſwers better than oats, barley, or wheat. I am led to make the ſame obſervations on it as the maiz, *viz.* that it is a hard, viſcid, leſs ſoluble ſubſtance than any of the other grains. It cannot be reduced to a fine enough meal. If we could open it by fermentation, it might be uſeful in food.

Having thus treated of the principal ſpecies of the *farinacea*, I now come to their preparations. By much the moſt common of theſe is bread, and without ſomewhat of this form no nations ſeem to live. Thus the Laplanders, having no corn of their own, make a ſort of bread of their dried fiſhes and of the inner rind of the pine, which ſeems to be uſed not ſo much for their nouriſhment as for ſupplying a dry food. For this mankind ſeem to have an univerſal appetite, rejecting bland, ſlippery, mucilaginous foods. This is not commonly accounted for, but ſeems to depend on very ſimple principles. The preparation of our food depends on the mixture of the animal fluids in every ſtage. Among others the ſaliva is neceſſary, which requires dry food as a neceſſary ſtimulus to draw it forth, as bland, ſlippery fluid aliments are too inert, and make too ſhort ſtay in the mouth to produce this effect, or to cauſe ſufficient degree of manducation to emulge that liquor. For this reaſon we uſe commonly dry bread along with animal food, which otherwiſe would too quickly

quickly be ſwallowed. For blending the oil and water of our food, nothing is ſo fit as bread, aſſiſted by a previous manducation. For which purpoſe bread is of like neceſſity in the ſtomach, as it is proper, that a ſubſtance of ſolid conſiſtence ſhould be long retained there. Now I have ſaid that the animal fluids muſt be mixed with our aliments, in order to change the aceſcency it undergoes. But liquid foods would not attain this end, whereas the ſolid ſtimulates and emulges the glands of the ſtomach. The bread then appears to be exceedingly proper, being bulky without too much ſolidity, and firm without difficulty of ſolution. Although the bread I here mention only of our own *farinacea*, yet in different countries others are uſed, as ſago, *&c.*

Bread is of two kinds, leavened or unleavened, *i. e.* ſubjected to fermentation, or only ſimple dough made of water. Leavened bread is of two kinds; firſt, as made of dough ſet to ferment naturally, and afterwards employed as a ferment to other dough; ſecondly, where we employ a ferment of vinous liquors. The firſt is a precarious uncertain operation in itſelf, and more eſpecially ſo in its application to a freſh maſs of unfermented dough. This is the method uſed in the ſouthern countries of Europe. The yeaſt uſed in the ſecond more preferable method is a more active ferment, and leſs liable to accident than the leaven, even although it is ſubject to be uſed too old, *&c.* and ſo we find Britiſh bread better raiſed than the French and more ſpungy; but it has a diſadvantage, eſpecially to ſtrangers, from the diſagreeable bitterneſs of hops often tainting our yeaſt, and ſo the bread as formed with it. The advantages of leavened bread are to promote aſſimilation and ſolution.

As to the firſt, all vegetable food becomes naturally more or leſs aceſcent, and it is the mode of this that forms a diſeaſe, *viz.* when the vinous fermentation takes place. Indeed, I alſo own, that diſeaſe may ſometimes depend on the quantity of acid produced. One way of obviating the vinous fermentation is, by giving our food ſomewhat of the acetous tendency, or throwing into the ſtomach ſome-

ſomewhat to have this effect. Unfermented, or too little fermented bread, will cauſe heart-burn; when too acid from over fermentation it will purge. This then explains the uſe of bread, and the degree of leavening neceſſary, *viz.* that it ſhould not be ſo much leavened as to purge, but ſufficiently ſo, in order to check the noxious vinous fermentation. The more aceſcent grains, as barley and rye, are more eſpecially purgative, and the huſks of all grain are ſomewhat of this nature, while the pure farina has leſs of it. Thus then the fineſt bread will be leaſt purgative, and the coarſeſt moſt certainly ſo. So far as to the aſſimilation, now with regard to the ſolution.

In all bodies there is blended a certain quantity of air, and nothing promotes ſolution more than the extrication of this air, which is particularly effected by fermentation. Application of heat, of a menſtruum applied, *&c.* would be of little avail, unleſs aſſiſted by a fermentation going on in the ſtomach, which is particularly aſſiſted by bread, which, beſides the advantages of ſolidity, *&c.* is of uſe, as having its own texture already opened, to prove a ferment to other food. Bread is neceſſarily in a ſolid and dry form, and hence is leſs ſoluble. To prevent this, and at the ſame time preſerve the ſolid form, is the purpoſe of baking. To make the bread cohere, water is uſed, and there is no greater ſecret in the art of baking than the quantity of this uſed, which, if too great, makes the whole concrete into a firm inſoluble maſs. Here we are apt to be deceived, as meal, like clay, will abſorb a conſiderable quantity, and ſtill retain its mealy form. This mixture muſt be made not with gentle ſtirring, but accurate kneading, in order to make a ſmall quantity of water ſuffice; for if gentle mixture were uſed, it, like the clay before-mentioned, would take in too much water, before it would cohere. After the mixture is made, we proceed to drying, which muſt be performed ſuddenly, all ſlow drying giving to ſubſtances a tough compact form, while ſudden drying gives a ſpongy porous texture. This is illuſtrated in making of paper, which, ſlowly dried, is of fine compact texture; whereas, if taken ſuddenly

denly from the mill, it is porous, ſinking, and ſpongy. Hence we can apprehend what are the qualities of bread properly dried; for the water, interpoſed as a gluten, is diſſipated, and leaves the bread in a conſiderable degree of friability. Its friability depends alſo on the fineneſs of the meal, and quality of the ferment applied, rendering it fit for manducation and ſolution in the ſtomach: Hence the difference between new bread and ſtale; the latter being more friable, and more eaſily ſoluble, is preferable, provided it has got none of the putrefactive taint: However, in ſtrong ſtomachs, this may too eaſily be diſſolved and digeſted, and therefore, in ſuch caſes, the other is to be choſen.

As to unleavened bread, which is uſed both here and in many other parts of Europe; this neceſſarily comes into a firm and tough cake, not having the advantage of fermentation to extricate the air. On account of this cloſeneſs of texture, it will retain the water more tenaciouſly: Hence the reaſon of the different form of unleavened bread being made out into thin cakes to favour their drying, which the more expeditiouſly it is done, for reaſons already aſſigned, without burning, it is the more ſoluble, friable, and porous. People obliged to uſe unleavened bread, have thought of adding butter, to render it more friable; but from this, perhaps, it is leſs miſcible with the watery fluids, and thoſe in the ſtomach; and hence, as we have ſaid, it is more aceſcent, and apt to produce heart-burn. We alſo ſometimes uſe bread leavened to a very great degree, under the name of ſour cakes. Theſe are made by adding a good deal of water to give them viſcidity, that they may be thinly extended. To obviate the effects of this viſcidity, they are rendered proportionably more ſour, on which account, when taken in conſiderable quantities, they are purgative. So far with regard to bread.

We now proceed to the other preparations of *farinacea*. Theſe, when made into paſte with water, and expoſed to a heat capable of coagulating our fluids, are hardened into indiſſoluble maſſes; but when

when they are mixed with cold water, and afterwards expoſed to a gradual heat, their ſolution is effected. This is illuſtrated by the preparation of haſty-pudding and water-gruel. The firſt practice is the moſt common, probably from being more ſolid and longer retained in the ſtomach, till it undergoes the proper aceſcent changes, while the water-gruel is little conſidered as a food, but rather as a drink, becauſe it paſſes quickly off. All the puddings are analogous in their preparation to the haſty pudding. The *farinacea* prepared by coagulation are of three kinds, pudding, pancake, and baken paſte; pudding is of two kinds as made of flower or bread. The firſt is coagulated into a firm maſs, which we ſhould not be able to diſſolve unleſs mixed with other matters, as ſuet; on the contrary, that made of bread, ſtill remains, after being drenched with water, eaſily ſoluble. Theſe are the common forms of pudding, though ſometimes they are made of grain, as rice, millet, *&c.* In this caſe the grain is firſt boiled, and then dried to a proper conſiſtence, and mixed with variety of ſubſtances. In all of theſe forms milk is commonly uſed rather than plain water, as giving a leſs tough conſiſtence. Eggs are alſo uſed to obviate aceſcency, as being of animal nature. 2. Pancakes. Here ſomewhat of a firm texture is required, and they are made out into thin plates for the ſame reaſon as the unleavened cakes. More water is neceſſary to give them tenacity, and butter is added to prevent fermentation. 3. Paſte. This is ſometimes made of fermented bread, but ordinarily of flower. As it is to be converted into various forms, it is made conſiderably tenacious. This is done by adding a large quantity of water, by ſlow drying, and other means. It would, therefore, be very hard without the addition of butter, and, after all, it is very indigeſtible, and apt to produce heartburn and aceſcency. Perhaps this is increaſed by the burned butter, from a certain ſenſibility in the ſtomach, which occaſions all empyreumatic oils to be long retained, and ſo turn ranceſcent and acid.

LEGU-

LEGUMINA.

Theſe are unctuous and oily, and have the oil intimately blended with a ſaccharine matter, ſo that they afford a pure and ſtrong nouriſhment; and that they do ſo appear from experiments made on domeſtic animals. It is obſerved too that ſervants, *cæteris paribus*, living on low grounds, where the *legumina* grow in great plenty, and are their chief food, fatten remarkably, and then, when tranſported to the higher ground, they turn weak and lean, living moſtly on the *culmiferous farinacea*, and ſometimes cannot recover them without having recourſe to the former diet. That the *legumina* are intended for food, a curious reaſon may be aſſigned. The *culmiferous*, indeed, are intended for food, but the ſame ground cannot produce them above one or two years without being exhauſted; whereas the *legumina* have no ſuch effect, and, interpoſed between the culmiferous crops, make theſe be borne more eaſily: And thus I have known a field, by alternate crops of the *culmiferæ* and *legumina*, after twenty-four years, without any particular culture, capable to produce the ſame crop of *culmiferæ* as at firſt. This practice is very ancient, and therefore *legumina* very early muſt have made a part of food.

Legumina are of a more firm texture and leſs ſoluble, therefore their uſe in food ſhould be confined to the hardy robuſt farmer. They are more flatulent than moſt vegetables, at leaſt than the *farinacea*. This depends not merely on that quantity of ſaccharine matter (which appears to be conſiderable, as appears from the rich ſweet procurable from them) as the bad effects of this are obviated by its intimate mixture with their oil, but on the great quantity of air there is lodged in that texture, and which, during their fermentation, is copiouſly extricated; and hence they are improper aliment for weak ſtomachs. They are uſed in two different ſtates, not only when fully ripe, (their effects in which caſe I have juſt now mentioned,) but alſo when very tender and green, at which time they

they have not attained the oil they afterwards gain, approach in their qualities to other *olera*, and are hardly more ſenſibly flatulent than theſe; but after all, in compenſation for theſe properties, their nutriment is proportionably diminiſhed.

In the Catalogue I have only ſet down of the *legumina*, peas, beans, and French beans, though many more of the ſame kind might have been added, as lentils, *&c.* but they are purpoſely omitted, as all of the ſame qualities, and I have only mentioned the three moſt commonly uſed.

The *phaſeoli*, or French beans, are here little known in their mature ſtate, but are uſed with their cod in the manner of *olera*, than which they are ſomewhat more firm and more nutritious. The *phaſeoli*, in their ripe ſtate, have a bitter diſagreeable huſk, deprived of which they are more tender, more ſoluble, and leſs flatulent than other legumina, even the peas, and for the purpoſes of peas, by the better ſort they are, for this reaſon, ſometimes imported, as for puddings.

Peas, both raw and ripe, are of a more tender and ſoluble texture than beans, and hence the better ſort ſeldom employ the bean, but uſe the pea for culinary purpoſes, as puddings, *&c.*

NUCES OLEOSÆ.

This term is not ſtrictly proper in a botanical ſenſe, but common language has authorized it. All theſe conſiſt of a farinaceous ſubſtance by itſelf, and have an oil in their compoſition, not mixed as in the legumina, but ſeparate, and eaſily obtained by proper expreſſion. Though this oil be ſeparate, yet, by triture with water, it may be united with the farinaceous ſubſtance into an homogeneous emulſion; and moſt of the preparations of *nuces oleoſæ* in food ſhould be made on this foundation. *Nuces oleoſæ* are leſs flatulent than the *legumina*, and even than the *farinacea*, and, on account of their copious

copious oil, more nutritive, but hence more difficultly aſſimilated, and its effects appear by ſtuffing the lungs, eſpecially ſuch as were formerly affected with any diſorder of the aſthmatic kind.

Let us now proceed to treat of the *Nuces oleoſæ* in particular. I have ranked them in the Catalogue according to alphabetical order, but according to the proportion of oil they may ſtand thus:

AVELLANA, CASTANEÆ, JUGLANDES, PISTACEÆ, AMYGDALÆ, CACAO.

HAZEL NUT.

This is leſs oily, and has its oil more intimately blended with the farinaceous ſubſtance than in the reſt, but all this is to be taken with diſtinction, of thoſe nuts in different countries, climates, and ſeaſons. Thus in the ſouthern, drier and hotter climates, the oil is more copious and ſeparate. Before theſe arrive at maturity, they are more watery than the other nuts.

CHESNUT.

This I ſuppoſe was the food of the ancients, and not the acorn of the oak, which is ſcarcely reducible to food. The later Botaniſts have very juſtly reduced the cheſnut tree to the genus of the *fagus*, and this was probably the ancient eſculent one. Cheſnuts ſtill, in ſome countries, make the chief parts of food to the lower kind of people, as in the fertile plains of Lombardy. They afford a copious nouriſhment, are ſomewhat of the nature of the *legumina*, having their oil intimately blended, and much air being fixed in their ſubſtance, and they are the moſt flatulent of the *nuces oleoſæ*.

WALNUTS.

Theſe are more oily than the former, and have that oil more ſeparate.

PISTACHIO.

This ſtill more abounds in oil, and may give a more copious nouriſhment, but it is ſcarcely poſſible to ſeparate from them the terbinthinal acrimony of the tree.

ALMONDS.

Theſe are the moſt agreeable of the nuts, but are no where produced in ſuch quantity as to afford a food. They are divided into bitter and ſweet, and the oil is ſaid to be obtained equally ſweet from both. And, indeed, it appears, that bitter and ſweet almonds are only varieties, which has made it a doubt whether the bitter almond ought to be uſed in food. The farina and oil of it are exactly the ſame, but its bitter makes it ſuſpicious, as the lawrel bitter, afterwards to be mentioned, may be procured from it, and as it is a poiſon to many animals. Some men, indeed, uſe them with impunity, but I think it a dangerous practice. They are, however, deprived of this acrimony by heat, and hence are uſed in baking; but we ſhould not from this infer, that the uſe of them, when freſh, is allowable.

CACAO NUTS.

Theſe contain the largeſt proportion of oil, and thence are hardly uſed without preparation, by mixing the oily with the farinaceous part, and on the accuracy of this mixture the quantity of their nouriſhment depends, as well as its eaſineſs of digeſtion. The chocolate made in Portugal and Spain is not near ſo well prepared as the Engliſh, depending, perhaps, on the machine employed here, viz. the double cylinder, which ſeems very well calculated for exact triture. If perfectly prepared, no oil appears on the ſolution. London chocolate gives up no oil like the foreign, and it alſo may, in ſome meaſure, depend on the thickneſs of the preparation. The ſolution requires more care than is commonly imagined. It is proper

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to break it down, and diſſolve it thoroughly in cold water, by milling with the chocolate ſtick. If heat be applied, it ſhould be done ſlowly; for if ſuddenly, the heat will not only coagulate it, but ſeparate the oil, and therefore much boiling after it is diſſolved is hurtful. Chocolate is commonly required by people of weak ſtomachs, but often rejected for want of proper preparation. When properly prepared it is eaſily diſſolved, and an excellent food where a liquid nutrient vegetable one is required, and is leſs flatulent than any of the *farinacea*.

OLIVES.

Theſe might be referred to the head of Condiment, and they are even uſed only pickled in thoſe countries where they are native, and their diſagreeable bitter is by this means corrected. I only mention them here, on account of the oil they afford ſo copiouſly.

I formerly ſtarted a queſtion about the uſe of oil, viz. Whether oil was neceſſary for nouriſhment, or only for ſupplying the great quantity of oil in the ſyſtem? Though the latter opinion be granted, yet I imagine oils are alſo directly nutritive, being copiouſly mixed and intimately blended with the other parts of our aliment, and thus conſtituting a part of the proper nutritious fluid. They are alſo neceſſary for aſſimulation; for the aceſcency of the *fructus acido dulces* would be difficultly ſubdued without theſe. Hence the uſe of oil and butter is almoſt as univerſal, and as neceſſary, as that of the *farinacea*. They give an aliment which approaches moſt to that obtained from animal food. They give a more denſe elaſtic blood, and probably, too, a more putreſcent one than vegetables. Their viſcidity alſo remains in ſome degree in the blood veſſels, on which account we ſhall mention them under the claſs of medicines. Dr. Ruſſel, in his *Natural Hiſtory of Aleppo*, tells us, "that in certain ſeaſons, when they uſe a great quantity "of oil there, they are then diſpoſed to ſomewhat of fever, with "remarkable infarction of the lungs, which ſymptoms wear off on "retrench-

"retrenching the uſe of oil." Conſidered as aliment, oil is difficultly perſpired, the meaning of which ſhall be afterwards explained. Theſe are the properties in general of our oily nouriſhment, whether oil or butter. Here a queſtion ariſes, Whether the Northern or Southern countries are ſupplied with the moſt agreeable ſubſtance of this kind? With regard to butter, it has always a quantity of animal mucilage mixed with it, and hence is eaſier miſcible with water. But hence, although from the mucilage it receive conſiſtence and ſomewhat of miſcibility with water, and hence more eaſily digeſted, yet from this very mixture it is more ranceſcent, and does not keep ſo long freſh as oil, and hence produces diſorders in the *primæ viæ*. In the Southern countries oil is procured little diſpoſed to ranceſcency, and therefore, where it can be uſed perfectly freſh, it is not ſo apt to produce ranceſcent diſorders as butter. But here it is not of equal advantage, and I never ſaw any in this country but had ſome degree of rancidity, and therefore, we ought not, in any caſe, to prefer the imported oils to good freſh butter. However, as freſh oil is certainly eligible, and as almonds, whoſe oil is better than that of olives, afford it but in inconſiderable quantity, I think we ought, as we have native ſeeds which will afford a pure oil in pretty large quantity, to endeavour to procure it from them.

DRINK.

The general uſe of drink is to ſupply fluid, facilitate ſolution, in conſequence of that to expede the evacuation of the ſtomach, and promote the progreſs of the aliment through the inteſtines; for, by the contraction of the longitudinal fibres of the ſtomach, the *pylorus* is drawn up, and nothing but fluid can paſs, which, by its bulk, makes a hurried progreſs through the inteſtines, and ſo determines a greater excretion by ſtool, as leſs then can be abſorbed by the lacteals. Hence a large quantity of common water has been found purgative, and, *cæteris paribus*, that aliment which is accompanied with the largeſt proportion of drink, makes the largeſt evacuation by ſtool.

ſtool. Here a queſtion has ariſen, about where the feculent part of the aliment is firſt remarkably collected? It is commonly thought to be in the great guts, but undoubtedly it often begins in the lower part of the *ileum*, eſpecially when the drink is in ſmall proportion, and when the progreſs of the aliment is ſlow; for when the contents of the guts are very fluid, they are quickly puſhed on, and reach the great guts before they depoſit any feculency. Another effect of drink is, to facilitate the mixture of the lymph, refluent from every part of the ſyſtem, with the chyle. In the blood-veſſels, where all muſt be kept fluid, in order to proper mixture, drink increaſes the fluidity, and gives tenſion, by its bulk, without concomitant acrimony or too much elaſticity, and ſo ſtrength and oſcillatory motion: Hence drink contributes to ſanguification, as ſometimes food gives too denſe a nutriment to be acted upon by the ſolids; and hence alſo we can ſee how drink promotes the ſecretions. Theſe are the effects of drink in general; but what I have ſaid muſt be taken with ſome limitations, for the more liquid the food, it is ſooner evacuated, and leſs nouriſhment is extracted: Hence drink is, in ſome degree, oppoſed to nouriſhment, and ſo, *cæteris paribus*, thoſe who uſe leaſt drink are moſt nouriſhed.

All the effects of drink above-mentioned are produced by ſimple water, and it may be ſaid, that other liquors are fit for drink in proportion to the water they contain. Water, when uſed as drink, is often impregnated with vegetable and farinaceous ſubſtances, but, as drinks, theſe impregnations are of little conſequence; they add, indeed, a little nouriſhment, but this is not to be regarded in a healthy ſtate. Sometimes we impregnate water with the *fructus acido dulces*, and then, indeed, it acquires other qualities of conſiderable uſe in the animal œconomy. All drinks, however, may be reduced to two heads; firſt, pure water, or where the additional ſubſtance gives no additional virtue; ſecondly, into the *fermentatæ*. Of the firſt we have already treated, and the latter have not only the qualities of the firſt, but alſo qualities peculiar to themſelves.

Fermented

Fermented liquors are more or leſs poignant to the taſte, and better calculated to quench thirſt. Thirſt may be owing to various cauſes; firſt, to defect of fluid in the ſyſtem, which occaſions a ſcanty ſecretion in the mouth, fauces, and ſtomach; the dryneſs of the mouth and fauces will alſo, in this caſe, be increaſed, by their continual expoſure to perpetual flux and reflux of the evaporating air; ſecondly, thirſt depends on a large proportion of ſolid viſcid food; thirdly, on an alkaleſcent aliment, eſpecially if it has attained any thing of the putrefactive taint; fourthly, on the heat of the ſyſtem; but this ſeems to operate in the ſame manner as the firſt cauſe, giving a ſenſe of dryneſs from its diſſipation of the fluids. The fermented liquors are peculiarly adapted for obviating all theſe cauſes, ſtimulating the mouth, fauces, and ſtomach, to throw out the *ſaliva* and gaſtric liquor by their poigancy; by their aceſcency they are fitted to deſtroy alkaleſcent acrimony, to quench thirſt from that cauſe; by their fluidity they dilute viſcid food; though here, indeed, they anſwer no better than common water. In two ways they promote the evacuation by ſtool, and progreſs through the inteſtines; firſt, by their fluidity and bulk; ſecondly, by their aceſcency, which, uniting with the bile, forms the peculiar ſtimulus formerly mentioned. Carried into the blood veſſels, in ſo far as they retain any of the ſaline nature, they ſtimulate the excretories and promote urine and ſweat, correcting thus alkaleſcency not only by mixture, but diſſipation of the degenerated fluids.

Many Phyſicians, in treating of fermented liquors, have only mentioned theſe qualities, rejecting their nutritious virtue, which certainly ought to be taken in; though by expeding the evacuation by ſtool they make leſs of the nutritious parts of the aliment to be taken up, and by ſtimulating the excretories make theſe nutritious parts to be for ſhorter time in the ſyſtem. All theſe, and many more effects, ariſe from fermented liquors. Their aceſcency ſometimes promotes the diſeaſe of aceſcency, by encreaſing that of vegetables, acting as a ferment, and ſo producing flatulency, purging, cholera, &c. ſo that, with vegetable aliment, as little drink

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is neceſſary, the moſt innocent is pure water; and it is only with animal food that fermented liquors are neceſſary. In warmer climates *fermentata* would ſeem neceſſary to obviate alkaleſcency and heat. But it ſhould be conſidered, that though fermented liquors contain an acid, yet they alſo contain alcohol, which, though it adds ſtimulus to the ſtomach, yet is extremely hurtful in the warmer climates, and wherever alkaleſcency prevails in the ſyſtem. Nature, in theſe climates, has given men an appetite for water impregnated with acid fruits, *e. g.* ſherbet, but the uſe of this needs caution, as in theſe countries they are apt to ſhun animal food, uſing too much of the vegetable, and often thus cauſing dangerous refrigerations, choleras, diarrhœas, &c.

Of varieties of fermented liquors, I ſhall only mention here the chief heads on which theſe varieties depend; firſt, they are owing to the quality of the ſubject, as more or leſs viſcid, upon its capacity alſo of undergoing an active fermentation, although, perhaps, the more viſcid be more nutritious. Hence the difference between ales and wines, by the firſt meaning fermented liquors from *farinacea*, by the ſecond from the fruits of plants. It depends, ſecondly, on the acerbity, acidity, nature, and maturation of the fruit. Thirdly, the variety depends on the conduct of the fermentation. In general, fermentation is progreſſive, being at firſt active and rapid, detaching the fixed air, or *gas ſylveſtre*, at the ſame time acquiring more acid than before. Theſe qualities of flatulency and acidity remain for ſome time, but as the fermentation goes on, the liquor becomes more perfect, no air is detached, and alcohol is produced, ſo that fermented liquors differ according to the progreſs of the fermentation, and have different effects on the ſyſtem. When fermentation is ſtopped before it comes to maturity, though naturally it proceeds in this way, yet by addition of new ferment it may again be renewed with a turbid inteſtine motion.

CONDIMENTA.

Condimenta are ſuch ſubſtances as are taken in with our food, to correct its bad tendencies, or to give it more agreeableneſs to the ſtomach. They are of different kinds.

1. AROMATA.

Theſe are certain acrid ſubſtances that we take in to give more taſte to our aliment; for though I ſaid our aliment ſhould be bland, yet the ſyſtem requires it ſhould be ſapid. This we obtain from the aromata, which ſtrictly are ſuch as are pungent with ſome degree of fragrancy, as cinnamon, cloves, nutmeg, mace, pimento, &c. which are the produce of the warmer climates. Analogous to theſe, in Europe are the umbelliferous ſeeds, aniſe, carraway, coriander, and the ſweet herbs. All theſe ſtimulate the ſtomach, and promote the periſtaltic motion, are antiſpaſmodic, taking off the ſpaſms ariſing from the flatulency of our food, and antiſeptic, moderating the putrid tendency of our aliment in the inteſtines. From theſe qualities they are fitly conjoined with our vegetable food, ſtimulating the ſtomach, promoting the mixture and afflux, in proper quantity, of the animal fluids, and obviating the effects of flatulency. They ought properly only to be uſed in thoſe countries where they are produced, becauſe from the heat people *there* live chiefly on vegetable diet. They are introduced *here* unfitly, and as a part of luxury, as any antiſeptic virtue they have would be overcome by their ſtimulus, &c.

There are certain acrid plants, the produce of our Northern climates, where animal food is indulged moſt freely and ſafely, and where that being inſipid, is fitly conjoined with theſe acrid ſubſtances, as condiments, &c.

The creſs kind, radiſh, *i. e.* horſe-radiſh, muſtard, creſſes themſelves, and indeed all the *ſiliquoſæ*. Theſe give taſte to inſipid aliment,

aliment, ſtimulate the ſtomach, and encreaſe the periſtaltic motion; they have no conſiderable antiſpaſmodic virtue, are manifeſtly powerful diuretics and diaphoretics, ſtimulating the excretories to throw out alkaleſcent matters. Hence they are fitly conjoined with animal food. The garlic tribe have the ſame virtues, ſtimulate the ſtomach, are diuretic and diaphoretic, and are uſed in our animal food as condiments. Theſe are the condiments taken from recent vegetables; there are alſo others, ſalt, vinegar, and ſugar.

SALT.

This is the moſt uſeful ſubſtance as a ſapid, is moſt univerſally uſed, and leaſt apt to pall, but beyond that quality I am at a loſs what to ſay, as its effects are not yet well explained by Phyſicians. It is ſaid to be antiſeptic; but this ſeems contradicted by obſerving, that it is often uſed with vegetables, and that carnivorous animals are poiſoned by it, where its antiſeptic quality would be moſt neceſſary; while the graminivorous ſeem fond of it, and the huſbandman often gives it to his cattle; and ſure here it cannot act by its antiſeptic quality. Dr. Pringle ſays, that a ſmall quantity of ſalt is ſeptic, and a large one antiſeptic: But here I think the experiment was not accurate, as the ſalt he employed was the common table ſalt, which is far from being a pure common ſalt. How this impure ſalt acted in promoting putrefaction may be eaſily conceived, *viz.* by the ſuperabundant alkali, or earth of the ſalt abſorbing the acid, which would, in ſome meaſure, have prevented putrefaction. Till once it be aſcertained that pure common ſalt is, in ſmall quantity, a ſeptic, we forbear accounting for this phænomenon. Common ſalt ſtimulates the ſtomach, excites appetite, and promotes excretion of gaſtric liquor. The nature of this body, as we take it with our aliment, is little underſtood. As it has been found to be ſeptic, we, apt to run into extremes, have concluded it produces ſcurvy from that power. Although ſcurvy is apt to be produced from ſalted meats, yet experiments evince that the ſame effects will reſult from animal foods alone, long continued, and ſalt alone has not yet been ſeen to produce that diſeaſe.

VINEGAR.

This contains various ſubſtances, and among the reſt a nutritious or a ſaccharine one, which, however, in accounting for its effects, may be entirely neglected, and we only conſider it here as a condiment. As ſuch, it gives a grateful taſte to the aliment, ſtimulates the ſtomach, and excites appetite. As an acetous ferment, it determines the acetous fermentation in foods, and hence in degree is of uſe even with vegetables themſelves.

It is enquired whether it is hurtful as an acid, and avoided by thoſe who are affected with recent aceſcent vegetables? In large proportions, like other acids, it may have bad effects, and therefore in ſuch quantity ought to be avoided by theſe.—Will it produce ſpaſms, flatulencies, &c. like recent aceſcent vegetables? It may; for the acetous fermentation is never conducted with ſuch care as the vinous, and there is commonly in vinegar a ſaccharine matter remaining, which has not yet undergone its firſt fermentation, which may be excited in the ſtomach, and produce all its bad effects. Its antiſeptic virtue is proved by experiment, and therefore is properly uſed with animal food. Its antiſeptic property, however, is not very powerful.

Other acids are uſed as condiments with animal food, as juice of lemons, which, as acerb, is therefore leſs liable to active fermentation; but as their acerbity differs much in different lemons, the ſame quantity of vinegar is more ſeldom found to have bad effects than of lemon juice, which, however, is more univerſally preferred to the vinegar, which, beſides its qualities formerly mentioned, is often ropy, foul, and diſagreeable. But in my opinion, if due attention is given to the quality of the vinegar, it is a much ſafer condiment.

Glauber propoſed the muriatic acid as a proper condiment, and has proved its uſe in ſeveral alimentary purpoſes, and ſays, That it

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is incapable of fermentation itſelf, and preventing aceſcency in vegetable as well as putreſcency in animal aliment. This, however, has not been tried, and as it is a ſubſtance unconquerable by our aſſimilatory organs, it would ſeem rather to be conſidered as a medicine, and never introduced as a condiment.

SUGAR.

This is one of the principal ingredients in vegetable aliment, and affords a pure and copious nouriſhment; it is frequently employed as a condiment alſo, but cannot be uſed for the ſame length of time, and in ſuch quantity, as common ſalt, as its taſte ſoon palls on repetition. It may likewiſe be conſidered as an antiſeptic, and, as a vegetable ſubſtance, is capable of all the effects of aceſcent vegetables. With vegetables it increaſes their quantity of nutriment, but does not, I believe, correct their bad qualities, or hinder fermentation. It is leſs actively fermentable than the *acido dulces* or *olera*, more ſo than the dried juice of fruits, as figs, *&c.* it ought, therefore, to be uſed ſparingly with vegetables, and moſt with animal food: If not over expenſive, it might be uſed with the latter as an antiſeptic, being more viſcid, and leſs liable to be decompoſed by ſolution, than common ſalt.

Since ſugar came to be commonly uſed, diſputes have ariſen about its wholeſomneſs. I have already laid the foundation of judgment on this ſubject; and many faults, without juſtice, have been aſcribed to it: It may indeed, by its aceſcency, be troubleſome in the *primæ viæ*, but no experiments prove its bad conſequences in the blood veſſels. It has been ſaid to ſpoil the teeth: Its effects in ſpoiling the teeth may indeed, in ſome caſes, be juſt, as where they have a more than ordinary degree of ſenſibility; or it may, perhaps, by what adheres of it about them, turning acid, corrode them: But faults of this kind are oftener imputed to it than it deſerves, for raiſins are more aceſcent, and yet whole nations uſe them with impunity; and the miſchiefs of what is called in Scotland eating of ſweeties, are wrongly imputed to ſugar. When arts were

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in a languiſhing ſtate in Europe, men lived much on animal food, and then ſcurvy was frequent; but now, when vegetables are more uſed, it is a rare diſeaſe, appearing only in long voyages or long winters, where vegetable food is not to be had. Putrid fevers, and epidemics, are alſo leſs frequent, as may appear from Sydenham's and Pringle's Obſervations, which I impute to the more frequent uſe of ſugar. Having now ſpoke of ſugar in general, we come to particular ſugars.

Coarſeſt ſugar is moſt aceſcent, moſt actively and readily fermentable, which is alſo increaſed by its viſcidity; and other ſugars, the finer and purer they are, have leſs and leſs of theſe qualities. From the qualities above-mentioned, coarſeſt ſugar is moſt laxative, and moſt productive of the diſorders ariſing from an active fermentation. Fine ſugar never turns drier, nor ceaſes to be nutritious, but is, however, always ſomewhat aceſcent. The lime employed never enters into the compoſition of the ſugar, and only renders it leſs aceſcent, and leſs actively fermentable.

Having mentioned the *Condimenta*, we now come to aliments preſerved by common ſalt, *&c.* But as animal food only is commonly preſerved by common ſalt, I paſs it over till we come to theſe.

VEGETABLE ALIMENT preſerved by SUGAR.

This preparation is ſo performed, that the ſaccharine matter is intimately and every where introduced into the pores of the vegetable ſubſtance; ſo that preparations of this kind may be conſidered as entirely ſugar, participating of none of the qualities of the vegetable, excepting thoſe of the acrid kind, as ginger. The ſame may be ſaid of

VINEGAR PRESERVES,

As vinegar is applied only to inſipid ſubſtances, or which, by boiling or ſoaking with it, become ſo; and ſo preparations of this kind may

may be conſidered as ſo many ſponges containing vinegar, and may indeed be employed to increaſe the flavour of food, and, as antiſeptics, will go as far as vinegar itſelf only. With regard to the ſmall quantity of *aromata* joined to theſe, their effects may be known from what we have ſaid before.

ANIMAL FOOD.

We formerly diſtinguiſhed animal from vegetable food, by ſaying, that it required no aſſimilation, but only ſolution and mixture. But this is not ſo clear as has been commonly imagined. What gives riſe to this doubt is, that carnivorous animals live on that without any vegetable mixture, or even ſalt, by which they are even poiſoned, living long without putrid accumulations, which, though for a ſhort time might produce little inconvenience, yet, in the courſe of life, would certainly produce bad conſequences. This accumulation is obviated by particulars in their œconomy, as ſhort inteſtines; whereas in the phytovorous, long inteſtines are given to give riſe to putreſcency. Again, the carnivorous animals are expoſed to putridity, from their irregularity, taking in water in ſmall quantity, &c. They are ſaid to be of quick excretions; but this is contradicted from their being capable to bear long abſtinence, being glutted today with a full meal, and ſtarved perhaps for ſeveral weeks after, which would be in other animals as the ſureſt means of puſhing putrefaction to the greateſt degree. From all this we muſt ſuſpect ſomething in carnivorous animals to prevent putrefaction.

Here let me offer a conjecture, viz. that the food in the ſtomach of carnivorous animals ſuffers a decompoſition in ſome degree, and becomes acid. This appears probable, from the change which decocted or elixated animal ſubſtances undergo, theſe broths becoming in time aceſcent: Beſides, it has been ſaid, that an acid is always found in the ſtomach of theſe animals: If it be really ſo, it can proceed from no other ſource but decompoſition. However, in accounting for the effects of animal food on the human body, we may neglect this, and conſider the diſeaſes thence ariſing to proceed from putridity;

putridity; for no man, as has been proved from experiment, can bear animal food alone, without nauſea, for even a few days. Putreſcency takes place in the ſtomach and inteſtines, in the firſt producing nauſea and thirſt, which would oftener occur unleſs obviated by the acid of vegetables conjoined with it; in the ſecond, violent purging, cholera, and dyſentery, from putrid exhalations.

Next, as to the ſolution of animal food. This, though ſeemingly of greater coheſion, is of more eaſy ſolubility than vegetables. However, I do not mean by this a quicker but a more entire ſolubility; for very firm animal ſubſtances are extracted and diſſolved in the human body, and the firmeſt, as bones, in ſtomachs *ſimilar* to the human, though, at the ſame time, I am convinced, that vegetables, which are not diſſolved at all, have yet their juices more *quickly* extracted than animal food, and paſs *ſooner* off. For eaſineſs of ſolubility does not depend ſo much on the firmneſs of texture, as on the viſcidity of the juice. Thus the more young and ſucculent animal food is leſs ſoluble than the old, veal than beef, lamb than mutton, &c. And Dr. Robinſon relates, that a Gentleman who uſed to take an evening puke, would throw up veal unchanged, while of beef there were no remains. Animal food excites the fever mentioned as conſequent on digeſtion in a greater degree than vegetable, giving a greater ſtimulus to the ſtomach, and ſo to the whole ſyſtem; and the difference of animal foods depends on the putreſcency and viſcidity taken together. Thus young food, being more viſcid than old, though leſs putreſcent, is yet leſs ſoluble. Animal food differs alſo as to its perſpirability, or paſſing off the laſt concoction. Sanctorius found mutton the moſt perſpirable, and Keil and he call oyſters leaſt ſo, ſo animal foods differ in their perſpirability, according as in their nature they approach nearer or recede farther from theſe.

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COMPARISON of ANIMAL and VEGETABLE FOOD.

First, *With regard to their difference in the ſtomach.* What we have ſaid of decompoſition, or aceſcency of animal food, never comes to a morbid degree, but the diſeaſe is always on the ſide of putreſcency, which degree, however, ſeldom occurs, except when animal food has been repeated in too great proportion, or too frequently, either from neceſſity, or too delicate luxury. The aceſcency, then, of vegetable aliment is more frequent, and ought more to be attended to than the alkaleſcency of animal, which laſt, even in weak ſtomachs, is ſeldom felt; while aceſcency affects much both the ſtomach and ſyſtem.

(2.) *With regard to their difference of ſolution.* Heavineſs, as it is called, is ſeldom felt from vegetables, except from tough farinaceous paſte, or the moſt viſcid ſubſtances; while the heavineſs of animal food is more frequently noticed, eſpecially when in any great quantity. Difficulty of ſolution does not depend ſo much on firmneſs of texture, (as a man, from fiſh of all kinds, is more oppreſſed than from firmer ſubſtances) but on viſcidity, and hence is more frequent in animal food, and eſpecially in the younger animals; all which makes it evident, that both ſolution, and the paſſage of the food from the ſtomach, is more owing to viſcidity than firmneſs.

(3.) *With regard to mixture.* There is no inſtance of difficult mixture in vegetables, except in vegetable oils, while animal foods, from both viſcidity and oilineſs, eſpecially the fatter meats, are refractory in this reſpect. I do not know whether the difference of animal and vegetable foods might not be referred to this head of mixture; for vegetable food continues long in the ſtomach, giving little ſtimulus: Now the ſyſtem is affected in proportion to the extent of this ſtimulus, which is incomparably greater from the animal viſcid oily food, than from the vegetable, firmer, and more aqueous. However, let me obſerve here, that there are certain

applications to the ſtomach, which have a tendency to bring on the cold fit of fever, independent of ſtimulus, merely by their refrigeration; and this oftner ariſes from vegetables; as we ſee, in thoſe hot countries where intermittents prevail, they are oftner induced from a ſurfeit of vegetable food than animal. A proof of this is, that when one is recovering of an intermittent, there is nothing more apt to cauſe a relapſe than cold food, eſpecially if taken on thoſe days when the fit ſhould return, and particularly aceſcent, fermentable vegetables, as ſallad, melons, cucumbers, &c. *acido dulces*, &c. which are, in my opinion, thoſe foods which are the moſt frequent cauſe of epidemics; therefore, when an intermittent is to be avoided, we ſhun vegetable diet, and give animal foods, although their ſtimulus be greater; and this, among others, is a proof that fever depends very much on the cold fit. Upon the whole, in attending to theſe four heads, *viz.* Aſſimilation, Solution, Mixture, and Stimulus, we ſhall be able to judge of the choice of food with regard to the *ſtomach*.

Next, *as to the inteſtines.* When the putreſcency of animal food has gone too far, it produces, as I have ſaid, an active ſtimulus, cauſing *diarrhœa*, *diſentery*, &c. But theſe effects are but rare; whereas from vegetable food and its acid, which, united with the bile, proves a pretty ſtrong ſtimulus, they more frequently occur, but luckily, however, are of leſs conſequence, if the refrigeration is not very great. In the autumnal ſeaſon, when there is a tendency to dyſentery, if it is obſerved that eating of fruits bring it on, it is rather to be aſcribed to their cooling than ſtimulating the inteſtines.

As to the effects of animal and vegetable food on ſtool. Wherever neither putrefaction, nor acidity, have gone a great length, I alledge that animal food keeps the belly more regular, and vegetable food gives a greater proportion of fæculent matter, and when exſuccated by the ſtomach and inteſtines, is more apt to ſtagnate, and produce flow belly and coſtiveneſs than animal ſtimulating food, which, before it comes to the great guts, where ſtoppage is made, has attained

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a putrefactive tendency, and gives a proper ſtimulus, and thus thoſe who are coſtive, from vegetable food, when they have recourſe to animal, are in this reſpect better.

4. *Effects of animal and vegetable foods in the blood veſſels.* They both give a blood of the ſame kind, but of different quality. Animal food gives it in greater quantity, being wholly, as the expreſſion is, convertible *in ſuccum et ſanguinem*, and of eaſy digeſtion; whereas the vegetable is more watery, and contains a portion of unconquerable ſaline matter, which cauſes it to be thrown out of the body by ſome excretion. Animal food affords a more denſe ſtimulating elaſtic blood than vegetable, ſtretching and cauſing a greater reſiſtance to the ſolids, and again exciting their ſtronger action. It has been ſuppoſed, that aceſcency of vegetable food is carried into the blood veſſels, and there exerts its effects; but the tendency of animal fluids is ſo ſtrong to alkaleſcency, that I cannot be perſuaded an acid acrimony ever exiſted in animal blood. Animal food alone will ſoon produce an alkaleſcent acrimony, and if a perſon who lives entirely on vegetables, were to take no food for a few days, his acrimony would be alkaleſcent.

We are next to take notice of the quantity of nutriment theſe different foods afford. Nutriment is of two kinds; the firſt repairs the waſte of the ſolid fibres, the other ſupplies certain fluids: The chief of theſe fluids is oil. Now, as animal food is eaſier converted, and alſo longer retained in the ſyſtem, and as it contains a greater proportion of oil, it will afford both kinds of nutriment more copiouſly than vegetables. A proof that corpulency is produced moſt by animal food is, that in England there are more fat people than in any country of twice the bulk in the world.

5. Laſtly, *As to the different degrees of perſpirability of theſe foods.* This is not yet properly determined. Sanctorius conſtantly ſpeaks of mutton as the moſt perſpirable of all food, and of vegetables as checking perſpiration. This is a conſequence of the different ſti-

mulus thoſe foods give to the ſtomach, ſo that perſons who live on vegetables have not their perſpiration ſo ſuddenly excited. In time of digeſtion, perſpiration is ſtopped from whatever food, much more ſo from cooling vegetables. Another reaſon why vegetables are leſs perſpirable, is, becauſe their aqueo-ſaline juices determine them to go off by urine, while the more perfectly mixed animal food is more equally diffuſed over the ſyſtem, and ſo goes off by perſpiration. Hence Sanctorius's accounts may be underſtood; for vegetable *aliment* is not *longer* retained in the body, but moſtly takes the courſe of the kidneys. Both are equally perſpirable in this reſpect, *viz.* that a perſon living on either, returning once a day to his uſual weight; and if we conſider the little nouriſhment of vegetables, and the great tendency of animal food to corpulency, we muſt allow that vegetable is more quickly perſpired than animal food.

Here I cannot avoid the queſtion ſo often handled, *Whether man was deſigned for animal or vegetable food?* This queſtion has been managed unfairly; for in all other animals they take it up as a fact, by obſerving what the animal chuſes; but they tell us man's reaſon leads him aſtray. For my part, I conceive little in this argument; for if in thoſe countries where no prejudice of cuſtom prevails, I ſee people live promiſcuouſly on both, I conclude Nature has deſigned both for them; and, indeed, when we examine the ſtructure of man's body, his teeth, ſtomach, and inteſtines, we find Nature has deſigned him for a mixed aliment. He has *dentes inciſivi & canini* like the carnivorous, and a double row of grinders like the graminivorous. His ſtomach approaches to that of the carnivorous animals, and his inteſtines in a middle between both, not ſo long as the phytovorous, but not ſo ſhort as the carnivorous animals. But I would truſt more to inſtinct producing practice, abſtracted from artificial opinions; and in theſe caſes we find the uſe of animals and vegetables promiſcuouſly. The Pythagoreans, and their modern imitators, the Brachmans, live on vegetables, merely from prejudice of opinion; and we need not heed thoſe mythologiſts, who tells us that

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man at firſt lived on vegetables, as their accounts are not founded on fact. They are oppoſed by this, that there are many nations ſtill in a crude ſtate, and whom luxury has not yet perverted, who are ſo far from living on vegetable food, that, from climate, they are obliged to live pretty entirely on animals; and the ſtate of the Hunter and Shepherd is more ſimple, and more antient, than that of the Farmer or Gardener.

With regard to the effects of theſe foods on men, I would alledge, there are no perſons who live entirely on vegetables; and the Pythagoreans themſelves eat milk; and thoſe who do ſo moſtly, as the Pythagoreans above-mentioned, are weakly, ſickly, and meagre, labouring under a conſtant *diarrhœa*, and ſeveral other diſeaſes. None of the hardy robuſt laborious live on theſe, but chiefly ſuch as gain a livelihood by the exertion of their mental faculties, as in the Eaſt Indies, factors and brokers; and this method of life is now confined to the hot climates, where vegetable diet, without inconvenience, may be carried to great exceſs. Though it be granted, therefore, that man is intended to live on theſe different foods promiſcuouſly, yet the vegetable ſhould be in very great proportion. Thus the Laplanders are ſaid to live entirely on animal food; but this is contradicted by the beſt accounts; for Linnæus ſays, that beſides milk, which they take ſour, to obviate the bad effects of animal food, they uſe alſo *calla*, *menyanthes*, and many other plants copiouſly. So there is no inſtance of any nation living entirely either on vegetable or animal food, though there are indeed ſome who live particularly on one or other in the greateſt proportion. In the cold countries, *e. g.* the inhabitants live chiefly on animal food, on account of the rigour of the ſeaſon, their ſmaller perſpiration, and little tendency to putrefaction.

Of more importance is the following than the former queſtion, viz. *In what proportion animal and vegetable ought to be mixed?* Firſt, I ſhall obſerve, that when I ſpeak of animal or vegetable foods here, I mean thoſe foods given in great proportion. To go on, then;

then; animal food gives moſt ſtrength to the ſyſtem. It is a known aphoriſm of Sanctorius, that *pondus addit robur*, which may be explained from the impletion of the blood veſſels, and giving a proper degree of tenſion for the performance of ſtrong oſcillations. Now animal food not only goes a greater way in ſupplying fluid, but alſo gives the fluid more denſe and elaſtic. The art of giving the utmoſt ſtrength to the ſyſtem is beſt underſtood by thoſe who breed fighting cocks. Theſe people raiſe the cocks to a certain weight, which muſt bear a certain proportion to the other parts of the ſyſtem, and which, at the ſame time, is ſo nicely proportioned, as that on loſing a few ounces of it, their ſtrength is very conſiderably impaired. Dr. Robinſon, of Dublin, has obſerved, that the force and weight of the ſyſtem ought to be determined by the largeneſs of the heart, and its proportion to the ſyſtem; for a large heart will give large blood veſſels, while, at the ſame time, the viſcera are leſs, particularly the liver, which laſt being encreaſed in ſize, a greater quantity of fluid is determined into the cellular texture, and leſs into the ſanguineous ſyſtem. Hence we ſee how animal food gives ſtrength, by filling the ſanguiferous veſſels. What pains we now beſtow on cocks, the ancients did on the *Athletæ*, by proper nouriſhment bringing them to a great degree of ſtrength and agility. It is ſaid that men were at firſt fed on figs, a proof of which we have ſaid formerly of their nutritious quality; however, in this reſpect they were ſoon found to fall far ſhort of animal food; and thus we ſee, that men, in ſome meaſure, will work in proportion to the quality of their food. The Engliſh labour more than the Scots, and wherever men are expoſed to hard labour, their food ſhould be animal. Animal food, although it gives ſtrength, yet loads the body; and Hippocrates long ago obſerved, that the athletic habit, by a ſmall encreaſe, was expoſed to the greateſt hazards. Hence it is only proper for bodily labours, and entirely improper for mental exerciſes; for whoever would keep his mind acute and penetrating, will exceed rather on the ſide of vegetable food. Even the body is oppreſſed with animal food; a full meal always produces dulneſs, lazineſs, and yawning; and hence the feeding of gameſters, whoſe mind muſt be ready to take

take advantages, is always performed by avoiding a large quantity of animal food. Farther, with regard to the ſtrength of the body, animal food in the firſt ſtage of life is hardly neceſſary to give ſtrength; in manhood, when we are expoſed to active ſciences, it is more allowable; and even in the decline of life, ſome proportion of it is neceſſary to keep the body in vigour. There are ſome diſeaſes, which come on at the decay of life, at leaſt aggravated by it; among theſe I mean the Gout. This, when it is in the ſyſtem, and does not appear with inflammation in the extremities, has pernicious effects there, attacking the lungs, ſtomach, head, *&c.* Now to determine this to the extremities, a large proportion of animal food is neceſſary, eſpecially as the perſon is commonly incapable of much exerciſe.

Animal food, although it gives ſtrength, is yet of many hazards to the ſyſtem, as it produces plethora and all its conſequences. As a ſtimulus to the ſtomach and to the whole ſyſtem, it excites fever, urges the circulation, and promotes perſpiration. The ſyſtem, however, by the repetition of theſe *ſtimuli*, is ſoon worn out; and a man who has early uſed the athletic diet, is either early carried off by inflammatory diſeaſes, or, if he takes exerciſe ſufficient to render that diet ſalutary, ſuch an accumulation is made of putreſcent fluids, as in his after life lays a foundation of the moſt inveterate chronic diſtempers. Therefore it is to be queſtioned, whether we ſhould deſire this high degree of bodily ſtrength, with all the inconveniencies and dangers. Plain it is, that thoſe who are chiefly employed in mental reſearches, and not expoſed to too much bodily labour, ſhould avoid an exceſs of animal food. There is a diſeaſe which ſeems to require animal food, *viz.* the hyſteric or hypochondriac, which to me ſeems to be very much a-kin to the Gout, affecting the alimentary canal. All people affected with this diſeaſe are much diſpoſed to aceſcency, and I have ſeen it go ſo far, that no other vegetable but bread could be taken in, without occaſioning the worſt conſequences. Here then we are obliged to preſcribe an animal diet, even to thoſe of very weak organs, for it generally obviates the ſymptoms. However, I have known ſeveral

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inſtances of ſcurvy in exceſs produced by a long continued uſe of this diet, which it is always unlucky to be obliged to preſcribe; and when it is abſolutely neceſſary to preſcribe, it ſhould be joined with as much of the vegetable as poſſible, and when a cure is performed, we ſhould gradually recur to that again. If this luxurious age could be perſuaded, this diſeaſe might be removed with much leſs danger, by exerciſe, freſh air, and avoiding warm chambers, venery, and late hours.

Next, let us conſider the vegetable diet. The chief inconveniency of this is difficulty of aſſimilation, which, however, in the vigorous and exerciſed, will not be liable to occur. In warm climates the aſſimilation of vegetable aliment is more eaſy, ſo that *there* it may be more uſed, and when joined to exerciſe gives a pretty tolerable degree of ſtrength and vigour; and though the general rule be in favour of *animal* diet, for giving ſtrength, yet there are many inſtances of their being remarkably produced from vegetable. Vegetable diet has this advantage, that it whets the appetite, and that we can hardly ſuffer from a full meal of it. Beſides the diſorders it is liable to produce in the *primæ viæ*, and its falling ſhort to give ſtrength, I do not know any bad conſequences it can produce in the blood veſſels, for where there is no inſtance where its peculiar acrimony was ever carried there, and it is certainly leſs putrifiable than animal food; nor without the utmoſt indolence, and a ſharp appetite, does it give generally plethora, or any of its conſequences; ſo that we cannot here but conclude, that a large proportion of vegetable food is uſeful for the generality of mankind.

There is no error in this country more dangerous, or more common, than the neglect of bread; for it is the ſafeſt of vegetable aliment, and the beſt corrector of animal food; and, by a large proportion of this alone, have I obviated its bad conſequences, when uſed in a hypochondriac ſtate. The French apparently have as much animal food on their tables as the Britons, and yet, by a greater uſe

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of bread, and the dried acid fruits, its bad effects are prevented; and therefore bread ſhould be particularly uſed by the Engliſh, as they are ſo voracious of animal food. Vegetable food is not only neceſſary to ſecure health, but long life; and, as we have ſaid, in infancy and youth we ſhould be confined to it moſtly; in manhood, and decay of life, uſe animal; and, near the end, vegetable again.

There is another queſtion much agitated, viz. *What are the effects of variety in food?* Is it neceſſary and allowable, or univerſally hurtful? Variety of a certain kind ſeems to me neceſſary, as vegetable and animal foods have their mutual advantages, tending to correct each other. Another variety, which is very proper, is that of liquid and ſolid food, which ſhould be ſo managed as to temper each other; and I formerly obſerved, that liquid food, eſpecially of the vegetable kind, is too ready to paſs off before it is properly aſſimilated, while ſolid food makes a long ſtay. But this does not properly belong to the queſtion, whether variety of the ſame kind is neceſſary or proper, as in animal foods, beef, fiſh, fowl, *&c.* I indeed have never perceived any inconvenience ariſing from this mixture, or difficulty of aſſimilation, provided a moderate quantity be taken; when any inconvenience does ariſe, it probably proceeds from this, that one of the particular ſubſtances in the mixture, when taken by itſelf, would produce the *ſame effect*; and, indeed, it appears to me, that this effect is not *heightened* by the mixture, but probably *obviated* by it. There are few exceptions to this, if any, *e. g.* taking a large proportion of aceſcent ſubſtances with milk. The coldneſs, *&c.* acidity, flatulency, *&c.* may appear, and it is poſſible that the coagulum, from the aceſcency of the vegetables, being ſomewhat ſtronger induced, may give occaſion to too long retention in the ſtomach, and to acidity in too great degree. Again, the mixture of fiſh and milk often occaſions inconveniencies. The theory of this is difficult, though, from univerſal conſent, it muſt certainly be juſt. Can we ſuppoſe that fiſh gives occaſion to ſuch a coagulum as rennet? If it does ſo, it may produce the fore-mentioned bad effects. Beſides, fiſh approach

ſomewhat to vegetables, in giving little ſtimulus, and are accuſed of the ſame bad effects as theſe, *viz.* bringing on the cold fit of fever.

Thus much may be ſaid for variety: But it alſo has its diſadvantages, provoking to gluttony; this, and the art of cookery, making men take in more than they properly can digeſt; and hence, perhaps very juſtly, Phyſicians have univerſally almoſt preferred ſimplicity of diet; for, in ſpite of rules, man's eating will only be meaſured by his appetite, and ſatiety is ſooner produced by *one* than by *many* ſubſtances. But this is ſo far from being an argument againſt variety, that it is one for it, as the only way of avoiding a full meal of animal food, and its bad effects, is by preſenting a quantity of vegetables. Another mean of preventing the bad effects of animal food, is to take a large proportion of liquid; and it is on that account the bad effects of animal food are not ſo much felt here, on account of our drinking much with it, and uſing broths, which are at once excellent correctors of animal food, and preventors of gluttony.

Having now finiſhed what we had to ſay on animal food in general, and diſcuſſed ſeveral compariſons and queſtions which aroſe on that ſubject, I now come to the particular ſubſtances mentioned in the Catalogue.

MILK.

Of the foods taken from animals, I chuſe to begin with milk, as it is a connecting and intermediate ſubſtance between animals and vegetables. I do not find it proper to enter juſt now into a minute chemical inveſtigation of this ſubject, eſpecially as you will ſoon have an opportunity of ſeeing that ſubject more fully treated than I can do here*. Milk ſeems immediately to be ſecreted from the chyle, both being a white liquor of the ſame conſiſtence: It is moſt copiouſly ſecreted after meals, and of aceſcent nature. In moſt animals who live on vegetables, the milk is aceſcent, and it is

* The Author here refers to a very ingenious Theſis, publiſhed about that time, on the ſubject of Milk — *De Lacte.*

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uncertain, though at the ſame time no obſervation proves the contrary, whether it is not ſo likewiſe in carnivorous animals. If it really be found of this nature it will ſolve the queſtion about the decompoſition and aceſcency of the food of theſe laſt mentioned animals in the *primæ viæ*. But whatever be in this, it is certain, that the milk of all animals, who live on vegetables, is aceſcent. Milk being derived from the chyle, we thence conclude its vegetable nature, for in thoſe who live on both promiſcuouſly, more milk is got, and more quickly, from the vegetable than the animal food. Milk, however, is not purely vegetable, though we have a vegetable liquor that reſembles its taſte, conſiſtence, colour, aceſcency, and the ſeparability of the oily part, I mean an emulſion of the *nuces oleoſæ* and farinaceous ſubſtances. But theſe want the coagulable part of milk, which ſeems to be of animal nature, approaching to that of the coagulable lymph of the blood. Milk, then, ſeems to be of an intermediate nature, between chyle taken up from the inteſtines, and their albumen, or fully elaborated animal fluid.

Its contents are of three kinds; firſt, an oily part, which, whatever may be ſaid concerning the origin of other oils in the body, is certainly immediately derived from the oil of the vegetables taken in, as with theſe it agrees very exactly in its nature, and would entirely, if we could ſeparate it fully from the coagulable part. Another mark of their agreement is the ſeparability, which proves that the mixture has been lately attempted, but not fully performed. 2dly, Beſides this oily, I have told you there is a proper coagulable part; and, 3dly, much water accompanies both, in which there is diſſolved a ſaline ſaccharine ſubſtance. Theſe three can be got ſeparate in cheeſe, butter, and whey, but never perfectly ſo, a part of each being always blended with every other part.

Nothing is more common, from what has been ſaid of its intermediate nature, than to ſuppoſe that it requires no aſſimilation, and hence has been deduced the reaſon of its exhibition in the

moſt weakly ſtate of the human body. But wherever we can examine milk we always find that it coagulates, ſuffers a decompoſition, and becomes aceſcent. Again, infants, who feed entirely on milk, are always troubled with eructations, which every body obſerves are not of the ſame quality with the food taken, and therefore I would alledge, that, like all other food, milk turns naturally aceſcent in the ſtomach, and only appears in the chyle and blood, in conſequence of a new recompoſition. It approaches then to the nature of vegetable aliment, but is not capable of its noxious vinous fermentation, and therefore has an advantage over it; neither from this quality, like animal food, is it heating in the ſtomach, and productive of fever, though at the ſame time, from its quantity of coagulable matter, it is more nouriſhing than vegetables.

Theſe are the general qualities of milk; now let us conſider theſe as applicable to food. Milk is the food moſt univerſally ſuited to all ages and ſtates of the body, but it ſeems chiefly deſigned by Nature as the food of infants. When animals are in the fœtus ſtate, their ſolids are a perfect jelly, incapable of an aſſimilatory power. In ſuch ſtate Nature has perfectly aſſimilated food, as the *albumen ovi* in the oviparous, and in the viviparous animals certainly ſomewhat of the ſame kind, as it was neceſſary the veſſels ſhould be filled with ſuch a fluid as would make way for an after aſſimilation. When the infant has attained a conſiderable degree of firmneſs, as when it is ſeparated from the mother, yet ſuch a degree of weakneſs ſtill remains, as makes ſomewhat of the ſame indication neceſſary. It behoves the infant to have an alkaleſcent food ready prepared, and at the ſame time its noxious tendency to be avoided. Milk then is given, which is alkaleſcent, and, at the ſame time, has a ſufficient quantity of acidity to correct that alkaleſcency. As the body advances in growth, and the alkaleſcent tendency is greater, the animal, to obviate that tendency, is led to take vegetable food, as more ſuited to its ſtrength of aſſimilation.

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I obſerved, that milk was almoſt ſuited to all temperaments, and it is even ſo to ſtomachs diſpoſed to aceſcency, more than thoſe ſubſtances which have undergone the vinous fermentation; nay, it even checks vinous fermentation, curing the heart-burn, and precipitating the lees, when, by renewal of fermentation, the wine happens to be fouled. It therefore very properly accompanies a great deal of vegetable aliment, although ſometimes its aceſcency is troubleſome, either from a large proportion taken in, or from the degree of it; for according to certain unaccountable circumſtances, different acids are formed in the ſtomach, in a healthy body a mild one; in the hypochondriac diſeaſe, *e. g.* one ſometimes as corroſive as the foſſil acids. When the acidity of milk is carried to a great degree, it may prove remarkably refrigerant, and occaſion cold crudities, and the recurrence of intermittent fevers. To take the common notion of its paſſing, unchanged, into the blood, it can ſuffer no ſolution. But if, with me, you admit its *coagulum* in the ſtomach, then it may be reckoned among ſoluble or inſoluble foods, according as that *coagulum* is more or leſs tenacious. Formerly rennet, which is employed to coagulate milk, was thought an acid, but, from late obſervations, it appears that, if it be an acid, it is very different from other acids, and that its *coagulum* is ſtronger than that produced by acids. It has been imagined that a rennet is to be found in the ſtomachs of all animals, which cauſes coagulation of milk; but to me the coagulation of milk ſeems to be owing to a weak acid in the ſtomach, the relicts of our vegetable food inducing, in healthy perſons, a weak and ſoluble *coagulum*; but in different ſtomachs this may be very different, in theſe becoming heavy and leſs ſoluble food, and ſometimes even evacuated in a coagulated undiſſolved ſtate, both by ſtomach and ſtool.

As milk is aceſcent, it may be rendered ſometimes purgative by mixing with the bile; and I know ſome examples of this. More commonly, however, it is reckoned among thoſe foods which occaſion coſtiveneſs.

Hoffman.

Hoffman, in his Experiments on Milk, found, that all kinds of it contained much water, and when this was diſſipated, found the reſiduum very different in their ſolubility. But we muſt not thence conclude, that the ſame inſolubility takes place in the ſtomach, for extracts made from vegetables with water are often very inſoluble ſubſtances, and hardly diffuſible through water itſelf; therefore in Hoffman's extracts, if I may ſo call them, of milk, ſomewhat of the ſame kind might have appeared, and theſe ſubſtances, which in their natural ſtate were not ſo, might appear very inſoluble. However, we may allow that milk is always ſomehow inſoluble in the inteſtines, as it is of a drying nature, and, as cheeſe, *&c.* is very coſtive. And this effect, I think, ſhows that milk is always coagulated in the ſtomach; for if it remained fluid no fæces would be produced, whereas ſometimes very hard ones are obſerved. In the blood veſſels, from its animal nature, it may be conſidered as nutritious; but when we conſider its vegetable contents, and aceſcency in the *primæ viæ*, we find that, like animal food, it does not excite that degree of fever in the time of digeſtion, and that from its aceſcency it will reſiſt putrefaction. Hence is the foundation of its uſe in hectic fevers, which, whatever be their cauſe, appear only to be exacerbations of natural feveriſh paroxyſms, which occur twice every day, commonly after meals, and at night. To obviate theſe, therefore, we give ſuch an aliment as produces the leaſt exacerbation of theſe fevers; ſuch is milk, on account of its aceſcent vegetable nature.

There appears alſo ſomewhat peculiar in milk, which requires only a ſmall exertion of the animal powers in order to its aſſimilation; and beſides, in hectic complaints there is wanted an oily, bland food, approaching to the animal nature, ſo that on all theſe accounts, milk is a diet peculiarly adapted to them, and, in general, to moſt convaleſcents, and to thoſe of inflammatory temperaments. There is a certain diſeaſe whoſe proper ſalutary form is that of inflammation, I mean the Gout. There is no method of curing, I had rather ſay preventing this, but by avoiding this inflammatory tendency

tendency by a proper regulation of diet. The inflammatory form, which I ſaid was the ſalutary one, is alſo attended with a weakneſs of the nerves, ſo that in our prevention we ſhould not weaken the ſyſtem too much, as would be done by vegetables, and therefore milk may be employed with advantage. However, it may be a queſtion how far, and in what caſes, we ought even to obviate the gout, which is often a conſtitutional diſeaſe, and has taken deep root in the ſyſtem, and if prevented in its native inflammatory form, will often be ſo by weakening too much, and ſo will appear in other more pernicious ones. But there can be no objection againſt attempting this by milk. However, that attempt ought not be made but very early in life, and then, if this diet be uſed with proper exerciſe, temperance, and avoiding of venery, there may be expectations of ſucceſs; for in the decline of life, after one has been uſed to high living, this low diet is often attended with pernicious conſequences. So far of milk in general. We ſhall now ſpeak of the particular kinds mentioned in the Catalogue, and which are in common uſe. I have ſet them down in the proportion of their ſolid contents.

The three firſt agree very much in their qualities, being very dilute, having little ſolid contents, and, when evaporated to dryneſs, having theſe very ſoluble, containing much ſaccharine matter, of a very ready aceſcency, and when coagulated, their *coagulum* being tender, and eaſily broke down. From this view you ſee they have leſs oil, and leſs coagulable matter than the reſt.

The three laſt agree, in oppoſite qualities, to the three mentioned; but here there is ſomewhat more of gradation. Cows milk comes neareſt to the former milks: Goats milk is leſs fluid, leſs ſweet, leſs flatulent, has the largeſt proportion of inſoluble part after coagulation, and indeed the largeſt proportion of coagulable part; its oily and coagulable part are not ſpontaneouſly ſeparable, never throwing out a cream, or allowing butter to be readily extracted from it. Hence the virtues of theſe milks are obvious,

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being more nouriſhing, though, at the ſame time, leſs eaſily ſoluble in weak ſtomachs, than the three firſt, leſs aceſcent than theſe, and ſo more rarely laxative, and peculiarly fitted for the diet of convaleſcents without fever. The three firſt, again, are leſs nouriſhing, more ſoluble, more laxative as more aceſcent, and adapted to the convaleſcents with fever.

Theſe qualities, in particular milks, are conſiderably diverſified by different circumſtances. Firſt, Different animals, living on the ſame diet, give a conſiderably different milk; for there ſeems to be ſomething in the conſtitution, abſtracting from the aliment, which conſtitutes a conſiderable diverſity of milk, not only in the ſame ſpecies of animals, but alſo in the ſame animal, at different ages, and at different diſtances after delivery: This, you will eaſily perceive, applies to the choice of nurſes. Secondly, Milk follows the nature of the aliment more than any other juice in the human body, being more or leſs fluid and dilute, more or leſs ſolid and nouriſhing, in proportion as theſe qualities are more or leſs in the aliment. *(a)* The nature of the aliment differs according to its time of growth, *e. g.* old graſs being always found more nouriſhing than young. *(b)* Aliment, too, is always varied according to the ſeaſon, as that is warm or dry, moiſt or cloudy.

The milk of each particular kind of animal is fitter for particular purpoſes, when fed on proper food. Thus the cow delights in the ſucculent herbage of the vale: If the ſheep be fed there he certainly rots, but on the higher and more dry ſide of the mountain he feeds pleaſantly and healthily; while the goat never ſtops near the bottom, but aſcends to the craggy ſummit: And certainly the milks of theſe animals are always beſt on their proper ſoil, and that of goats is beſt on a mountainous country. From a diſſertation of Linnæus, we have many obſervations concerning the diverſity of plants on which each animal chuſes to feed. All the Swediſh plants, which could be collected together, were preſented alternately to domeſtic animals, and then it appeared that the goat

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lived on the greateſt variety, and even on many which were poiſonous to the reſt; that the cow choſe the firſt ſucculent ſhoots of the plant, and neglected the fructification, which laſt was preferred by the goat. Hence may be deduced rules concerning the paſturage of different animals; *e. g.* Farmers find that, in a paſture which was only fit to feed a certain number of ſheep, an equal number of goats may be introduced, while the ſheep are no leſs nouriſhed than before.

RULES of the COOKERY of MILK.

It is not eaſy to aſſign the difference between milk freſh drawn and that detained in the open air for ſome time, but certainly there is ſome material one, otherwiſe nature univerſally would not have directed infants to ſucking; and indeed it ſeems, better than the other, fitted for digeſtion and nouriſhment. Phyſicians have ſuppoſed that this depended on the evaporation of ſome ſpt. rector, but indeed I cannot conceive any ſuch, except common water here; and beſides, theſe volatile parts can hardly be nutritious. A more plauſible account ſeems deducible from mixture: Milk, new drawn, has been but lately mixed, and is expoſed to ſpontaneous ſeparation, a circumſtance hurtful to digeſtion, none of the parts being, by themſelves, ſo eaſily aſſimilated as when they are all taken together. Hence, then, milk new drawn is more intimately blended, and therefore then is moſt proper to the weakly and infants.

Another difference in the uſe of milk expoſed for ſome time to the air, is taking it boiled or unboiled. Phyſicians have generally recommended the former, but the reaſon is not eaſily aſſigned. Perhaps the reaſon is this, Milk kept for ſome time expoſed to the air has gone ſo far to a ſpontaneous ſeparation; whereas the heat thoroughly blends the whole, and hence its reſolution is not ſo eaſy in the ſtomach; and thus boiled milk is more coſtive than raw, and gives more fæces. Again, when milk is boiled, a conſiderable quantity of air is detached, as appears from the froth on the ſurface, and air is the chief inſtrument of fermentation in

bodies, ſo that, after this proceſs, it is not liable to aceſcency; for theſe reaſons it is proper for the robuſt and vigorous.

Another difference of milk is, according as it is fluid or coagulated. The coagulated is of two kinds, as induced by rennet, or the natural aceſcency of the milk. The former preparation makes the firmer and leſs eaſily ſoluble *coagulum*, though, when taken with the whey unſeparated, it is leſs difficult of ſolution, though more ſo than any other *coagulum* in the ſame caſe. Many nations uſe the latter form, which is eaſier ſoluble, but very much aceſcent, and therefore, in point of ſolution, ſhould be confined to the vigorous, in point of aceſcency, to thoſe who live on alkaleſcent food; and in the laſt caſe the Laplanders uſe it as their chief aceſcent condiment. From the ſame conſiderations it is more cooling, and in its other effects like all other aceſcent vegetables.

We now come to the examination of the parts into which milk ſeparates; and firſt, with regard to the

COAGULABLE PART.

This we uſe at all different ages, from freſh cured to old cheeſe. The whole of this is chiefly animal; hence it is the moſt nutritive part, and much the moſt inſoluble, and hence gives moſt fæces, and therefore the common notion of cheeſe's coſtiveneſs is juſt. So far of cheeſe in general. It differs in proportion to the quantity of oily parts natural or addition in the coagulable part. The more rich oily parts there are in cheeſe, the more it is nutritive and ſoluble, lean cheeſe being among the moſt inſoluble aliments. Cheeſe is liable to rancidity and putrefaction, and then we muſt conſider it as having all the effects of animal food the farther advanced to putrefaction; at this time it ceaſes to be nutritive, and is only to be conſidered as a fit condiment for vegetable food. In general, cheeſe, as an aliment, is only fit for the laborious and robuſt.

OILY

OILY PART.

We uſe this, in conſequence of its immediate ſpontaneous ſeparation, in the ſtate of cream. This is liable to acidity and rancidity, on both which accounts it is of difficult mixture and digeſtion in the ſtomach, and I do not know but all the bad effects of milk may be imputed to cream, the quarter part of which is not pure oil, and the reſt coagulable and ſaline parts. In the form of butter the oil is much more pure, and then may be uſed with advantage in diet: I have mentioned it as a ſtrong nutriment, fit to accompany our vegetable diet, eſpecially to the leaner *farinacea*, in order to give them, in ſome meaſure, the qualities of the rich *nuces oleoſæ*. Butter is more ranceſcent than olive oil, but as that cannot be had here, either pure or freſh, we uſe our own butter with greater propriety.

WATERY SALINO-SACCHARINE PART.

This will be different, according as the milk has been coagulated by rennet, or its own aceſcency. By rennet, the coagulable part is more purely ſeparated, and a proportion of oil goes along with the whey; but when the milk is coagulated by its own ſouring, the watery part is almoſt purely acid, and ſeldom uſed. The whey contains much ſaccharine part, and ſo is more aceſcent than entire milk, and has even been ſaid to be capable of vinous fermentation: Certainly it approaches nearer to it than milk itſelf, and hence is more capable of a noxious aceſcency, and hence is more purgative and flatulent than milk. Of all ingredients in milk, there is a great proportion which goes along with the whey, and therefore it will be a nutritious ſubſtance, though at firſt ſight, as that was ſuppoſed to be ſeparated, it might ſeem otherwiſe. Different milks yield wheys of different qualities; cows milk allows its oil to be ſeparated in greateſt proportion in the whey, ſheep leſs, and goat not at all. In ſome meaſure the whey follows the nature of the milk; goats whey is more nutritious, and may be ſubſtituted for womens, aſſes, and mares, in hectic caſes, *&c.* Goats whey is

a medicine of great uſe in many caſes, and perhaps its advantages are improved by the neceſſary reparation to mountainous countries to obtain it, not only becauſe it is there more perfect, but alſo becauſe of the change of the ſmoaky city air into light and ſalubrious. By taking theſe ſubſtances in the form of whey, there is introduced into the habit a bland, eaſily aſſimilated nouriſhment, paſſing off eaſily by the ſecretions, and ſoon changing the ſtate of the fluids. If it were not for regard to the ſtate of the ſtomach, liquid food would often be employed with advantage, as, in many caſes, encreaſe of fluidity gives encreaſe of nouriſhment; and thus a calf is more effectually nouriſhed by diluting its milk with equal quantity of water, than if the milk were given alone. Quite analagous to this is the taking in this bland and mild nouriſhment in form of whey, eſpecially from the richer milk.

BUTTER MILK.

Here the whey and coagulable part are more entirely ſeparated from the oily, but the coagulable part in butter milk is broke down, reſolved, and of eaſy digeſtion. As it is very ſaccharine it is very nutritious, but not without acidity, and therefore is more cooling to the ſyſtem, and more ſuited to the inflammatory and alkaleſcent diatheſis, than milk, but for the ſame reaſon it is noxious where refrigeration is hurtful.

Condiments of milk, as liable to aceſcency and cooling in particular conſtitutions. Where this tendency is apprehended, it may be accompanied with ſome of the *aromata*, and cream and whey are there often attended with advantage if uſed with theſe. Sugar is another condiment. If milk is liable to aceſcency, this would ſeem to encreaſe it, and indeed it does ſo in ſtomachs ſo diſpoſed. But ſugar has another effect, *viz.* preventing the ſpontaneous ſeparation of milk, and therefore has many of the advantages of newly drawn milk. It is proper, therefore, to give ſugar along with milk to convaleſcents. Conſerve of roſes is often employed,

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and acts only by its ſugar, two-thirds of it being ſuch; and honey itſelf, the moſt aceſcent of all the ſweets, is often employed with advantage.

Having now finiſhed what we had to ſay on Milk, the intermediate ſubſtance between Animal and Vegetable, we now come to

ANIMAL FOOD, ſtrictly ſo called.

The firſt difference of animal food regards its ſolubility, depending on a lax or firm texture of its different kinds. Solubility of animal food ſeems to deſerve leſs attention than is commonly imagined; for I have known perſons of a weak ſtomach incapable of breaking down the texture of vegetables, or even of diſſolving a light pudding, to whom hung beef, or a piece of ham, was very grateful, and eaſily digeſted. None of the theories given for the ſolution of animal food in the human ſtomach ſeem to me ſufficiently to have explained that proceſs. Long ago has been diſcarded the ſuppoſition of an active corroſive menſtruum there, and alſo the doctrine of trituration, for which, indeed, there ſeems no mechaniſm in the human body; and we now commonly agree with Boerhaave, ſuppoſing nothing more neceſſary than a watery menſtruum, moderate heat, and frequent agitation. This will account for ſolution in ſome caſes, but not entirely. Let us try to imitate it out of the body with the ſame circumſtances, and in ten times the time in which the food is diſſolved in the ſtomach, we ſhall not be able to bring about the ſame changes. Take the coagulated white of an egg, which almoſt every body can eaſily digeſt, and yet no artifice ſhall be able to diſſolve it. Hence then we are led to ſeek another cauſe for ſolution, *viz.* fermentation, a notion, indeed, formerly embraced, but, on the introduction of mechanical philoſophy, induſtriouſly baniſhed, with every other ſuppoſition of that proceſs taking place at all in the animal œconomy.

Many of the Ancients imagined this fermentation to be putrefactive; but this we deny, as an acid is produced; though hence the

the fermentation might be reckoned the vinous, which, however, I have formerly proved to you to be morbid. Neither, indeed, is the fermentation purely acetous, but modified by putreſcents; for Pringle has obſerved, that animal matters raiſe and even expede the acetous proceſs. The fermentation, then, in the ſtomach is of a mixed nature, between the acetous and putrefactive, mutually modifying each other; though, indeed, in the inteſtines, ſomewhat of the putrefactive ſeems to take place, as may be obſerved from the ſtate of the fæces broke down, and from the little diſpoſition of ſuch ſubſtances to be ſo, which are not liable to the putrefactive proceſs, as the firmer parts of vegetables, *&c.* Upon this view ſolution ſeems to be extremely eaſy, and thoſe ſubſtances to be moſt eaſily broke down which are moſt ſubject to putrefaction.

But ſolution alſo depends on other circumſtances, and hence requires a more particular regard. Firſt, there is a difference of ſolubility with reſpect to the manducation of animal food, for which bread is extremely neceſſary, in order to keep the more ſlippery parts in the mouth till they be properly comminuted. From want of proper manducation I have known many perſons ſubject to eructations, and this more frequently from the firm vegetable foods than from the animal, as apples, almonds, *&c.* though, indeed, even from animal food, very tendinous, or ſwallowed in unbroken maſſes, ſuch ſometimes occur. Manducation is ſo much connected with ſolution, that ſome, from imperfectly performing that, are obliged to belch up their food, remanducate it, and ſwallow it again before the ſtomach can diſſolve it, or proper nouriſhment be extracted. Another proof of our regard to ſolubility, is our rejecting the firmer parts of animal food, as bull beef, and generally carnivorous animals.

Its effects with regard to ſolubility I alſo take, ſecondly, to be the foundation of our choice between *fat* and *lean*, *young* and *old meats*. In the *lean*, although, perhaps, a ſingle fibre might be ſufficiently tender, yet theſe, when collected in *faſciculi*, are very firm and

and compact, and of difficult ſolution; whereas in the *fat* there is a greater number of veſſels, a greater quantity of juice, more interpoſition of cellular ſubſtance, and conſequently more ſolubility. Again, in young animals, in my opinion, there is the ſame number of fibres as in the older, but theſe more connected; whereas, in the older, the growth depending on the ſeparation of theſe, and the encreaſe of veſſels and cellular ſubſtance, the texture is leſs firm and more ſoluble, which qualities, with regard to the ſtomach, are at that time too encreaſed, by the encreaſed alkaleſcency of the animal. To this alſo may be referred our choice of caſtrated animals, *viz.* on their diſpoſition to fatten after the operation.

3. It is with a view to the ſolubility, that we make a choice between meats recently killed, and thoſe which have been kept for ſome time. As ſoon as meat is killed the putrefactive proceſs begins, which commonly we allow to proceed for a little, as that proceſs is the moſt effectual breaker down of animal matters, and a great aſſiſtance to ſolution. The length of time during which meat ought to be kept, is proportioned to the meat's tendency to undergo the putrid fermentation, and the degree of thoſe circumſtances which favour it: Thus in the Torrid Zone, where meat cannot be kept above four or five hours, it is uſed much more recent than in theſe northern climates.

4. *Boiled* or *roaſted* meats create a difference of ſolution. By boiling we extract the juices interpoſed between the fibres, approximate them more to each other, and render them of more difficult ſolubility, which is encreaſed too by the extraction of the juices, which are much more alkaleſcent than the fibres; but when we want to avoid the ſtimulus of alkaleſcent food, and the quick ſolution, as in ſome caſes of diſeaſe, the roaſted is not to be choſen. Of roaſted meat, it may be aſked whether are more proper, thoſe which are moſt or leaſt roaſted. That which is leaſt done is certainly the moſt ſoluble; even raw meats are more ſoluble than dreſſed, as I know from a perſon who from neceſſity was obliged,

for

for ſome time, to eat ſuch: But at the ſame time that meats little done are very ſoluble, they are very alkaleſcent; ſo that, wherever we want to avoid alkaleſcency in the *primæ viæ*, the moſt roaſted meats ſhould be choſen. Thoſe who throw away the broths of boiled meat do very improperly; for, beſides their ſupplying a fluid, (as I formerly obſerved,) from their greater alkaleſcency they encreaſe the ſolubility of the meat. Here we ſhall obſerve, that pure blood has been thought inſoluble; undoubtedly it is very nutritious, and though out of the body, like the white of eggs, it ſeems very inſoluble, yet, like that too, *in* the body it is commonly eaſily digeſted. Moſes very properly forbad it the Iſraelites, as, in warm countries, it is highly alkaleſcent, and even here, when it was uſed in great quantity, the ſcurvy was more frequent; but to a moderate uſe of it, in theſe climates, no ſuch objection takes place.

5. Solubility is varied from another ſource, *viz.* viſcidity of the juice of aliment. Young animals, then, appear more ſoluble than old, not only on account of their compaction and firmneſs of texture, but alſo on their greater viſcidity of juice. See Dr. Brian Robinſon, of Dublin, on this head. And nothing is more common, as we obſerved, than to be longer oppreſſed from a full meal of veal, than from the ſame quantity of beef, *&c.* Upon account too of their greater viſcidity of juice, are the tendinous and ligamentous parts of animals longer retained than the purely muſcular, as well as on account of their firmneſs of texture. Even fiſhes, whoſe muſcular parts are exceedingly tender, are, on account of their gluey viſcoſity, longer of ſolution in the ſtomach. And eggs, too, which are exceedingly nouriſhing, have the ſame effect, and cannot be taken in great quantity: For the ſtomach is peculiarly ſenſible to gelatinous ſubſtances, and by this means has Nature perhaps taught us, as it were by a ſort of inſtinct, to limit ourſelves in the quantity of ſuch nutritive ſubſtances.

6. With regard to ſolution, we muſt take in the oils of animal food, which, when tolerably pure, are the leaſt putreſcent part of it,

it, and by diminiſhing the coheſion of the fibres, render them more ſoluble. On this laſt account is the lean of fat meat more eaſily diſſolved than other lean. But when the meat is expoſed to much heat, this oil is ſeparated, leaving the ſolid parts leſs eaſily ſoluble, and becoming itſelf empyreumatic, ranceſcent, and of difficult mixture in the ſtomach. Fried meats, from the reaſons now given, and baked meats, for the ſame, as well as the tenacity of the paſte, are preparations which diminiſh the ſolubility of the food. From what has been ſaid, the preparation of food by fattening it, and keeping it for ſome time after killed, although it may adminiſter to gluttony, will yet, it muſt be confeſſed, encreaſe the ſolution of the food.

The ſecond difference of animal food is with regard to

ALKALESCENCY.

Of this we have taken a little notice already under the firſt head of Solubility.

Firſt, From the too great alkaleſcency we commonly avoid the carnivorous animal, and the *feræ*, and chuſe rather the graniverous. Some birds, indeed, which live on inſects, are admitted into our food; but no man, without *nauſea*, can live long upon theſe alone, for any length of time. Fiſhes, too, are an exception to this rule, living almoſt univerſally on each other. But in theſe the alkaleſcency does not proceed ſo far; whether from the viſcidity of their juice, their want of heat, or ſome peculiarity in their œconomy, I will not pretend to determine.

Secondly, Alkaleſcency is determined by difference of age. The older animals are always more alkaleſcent than the young, from their continual progreſs to putrefaction. Perhaps this may depend on the nouriſhment of the younger animals, milk, vegetables, *&c.* Homberg always found, in his endeavours to extract an acid from

human blood, that more was obtained from the young than from the old animals.

A third circumſtance which varies the alkaleſcency of the food, is the wildneſs or tameneſs of the animal; and this again ſeems to depend on its exerciſe. I knew a Gentleman who was fond of cats for food, but he always uſed to feed them on vegetable food, and keep them from exerciſe; and in the ſame manner did the Romans rear up their rats, when intended for food. In the ſame way the fleſh of the partridge and hen ſeems to be much the ſame; only, from its being more on the wing, the one is more alkaleſcent than the other. Again, tame animals are commonly uſed without their blood, whereas the wild are commonly killed in their blood, and upon that account, as well as their greater exereiſe, are more alkaleſcent.

Fourthly, The alkaleſcency of food may be determined from the quantity of volatile ſalt it affords. The older the meat is, it is found to give the greater proportion of volatile ſalt.

Fifthly, The alkaleſcency of aliment may alſo, in ſome meaſure, be determined from its colour, the younger animals being whiter and leſs alkaleſcent. We alſo take a mark from the colour of the gravy poured out, according to the redneſs of the juices judging of the animal's alkaleſcency.

Laſtly, The reliſh of food is found to depend much on its alkaleſcency, as alſo the ſtimulus it gives and the fever it produces in the ſyſtem. Theſe effects are alſo complicated with the viſcidity of the food, by which means it is longer detained in the ſtomach, and the want of alkaleſcency ſupplied.

Having mentioned Animal Food as differing in ſolubility and alkaleſcency, which often go together in the ſame ſubject, we come to the third difference, *viz.*

QUAN-

QUANTITY of NUTRIMENT,

Which is either abſolute or relative; abſolute with reſpect to the quantity it really contains, ſufficient powers being given to extract it; relative, with reſpect to the aſſimilatory powers of thoſe who uſe it. The abſolute nutriment is of ſome conſequence, but the relative in the robuſt and healthy, and except in caſes of extraordinary weakneſs, may, without much inconvenience, be diſregarded. In another caſe is the quantity of nouriſhment relative, *viz.* with regard to its *perſpirability*; for if the food is ſoon carried off by the excretions, it is the ſame thing as if it contained a leſs proportion of nouriſhment. For, giving more fluid, that which is longer retained affords moſt, and for the repair of the ſolids, that retention alſo is of advantage. Now gelatinous ſubſtances are long retained, and are, beſides, animal ſubſtances themſelves, diſſolved ſo, that, both abſolutely and relatively, ſuch ſubſtances are nutritious. Of this kind are eggs, ſhell fiſh, *&c.* In adults, though it is diſputed whether their ſolids need any repair, yet at any rate, at this period, fluid is more required; for this purpoſe the alkaleſcent foods are moſt proper, being moſt eaſily diſſolved. They are, at the ſame time, the moſt perſpirable; on one hand that alkaleſcency leading to diſeaſe, while on the other their perſpirability obviates it. Adults, therefore, as Writers juſtly obſerve, are better nouriſhed on the alkaleſcent; the young and growing, on gelatinous foods. All this leads to a compariſon of young and old meats, the firſt being more gelatinous, and the laſt more alkaleſcent. This, however, by experience, is not yet properly aſcertained. Mr. Geoffroy is the only perſon I know who has been taken up with the analyſis of foods. See Memoirs de l'Academie l'an 1731 & 1732. His attempt was certainly laudable, and in ſome reſpects uſefully performed, but in general his experiments are not ſufficiently repeated, nor, indeed, ſufficiently accurate; and I would refuſe that beef and veal have been properly examined, for he has not been on his guard againſt the various circumſtances which affect meats; the cow kind liking a moiſt

ſucculent herbage, which is not to be got in warm climates; while the ſheep are fond of a dry food, and thrive beſt there. Again, ſome of his experiments ſeem contradictory. He ſays, that veal gives more ſolution than beef, while lamb gives leſs than mutton; which, I confeſs, is much to be doubted. If both he and Sanctorius had examined Engliſh beef, the reſult, probably, would have been very different as to its perſpirability, *&c.* Beſides, Mr. Geoffroy has only analiſed beef and veal when raw, has made no proper circumſtantial compariſons between quadrupeds and birds, and has examined theſe laſt along with their bones, and not their muſcles, *&c.* by themſelves, as he ought to have done, *&c.* If a ſet of experiments of this kind were properly and accurately performed, they might be of great uſe; but at preſent, for the purpoſe of determining our preſent ſubject, we muſt have recourſe to our alkaleſcency, ſolubility, *&c.*

The fourth difference of animal foods is

The NATURE of the FLUIDS they afford.

The whole of this will, I think, be underſtood, from what has been ſaid on alkaleſcency, the fluid produced being more or leſs denſe and ſtimulating, in proportion as that prevails.

The fifth difference of animal foods is with reſpect to their

PERSPIRABILITY.

The ſum of what I have to ſay on this matter is this, that ſuch foods as promote an accumulation of fluid in our veſſels, and diſpoſe to plethora, are the leaſt perſpirable, and commonly give moſt ſtrength; that the more alkaleſcent foods are the moſt perſpirable, though the viſcid and leſs alkaleſcent may attain the ſame property by long retention in the ſyſtem. The authors on Perſpirability have determined the Perſpiration of Foods as imperfectly as Mr. Geoffroy has done the Solubility, and in a few caſes only. We muſt

muſt not lay hold on what Sanctorius has ſaid on the perſpirability of mutton, becauſe he has not examined, in the ſame way, other meats in their perfect ſtate; far leſs on what Keil ſays of oyſters, as he himſelf was a valetudinarian, and conſequently an unfit ſubject for ſuch experiments, and probably of a peculiar temperament.

Having now finiſhed the examination of Animal Food in general, we come to the conſideration of particular Animals, of which much cannot be expected to be ſaid, after we have ſo fully delivered our general principles.

Animals are divided into ſix claſſes, the *Quadrupedia*, *Aves*, *Amphibia*, *Piſces*, *Inſecta*, *Vermes*. In my Catalogue I have entirely omitted the *Amphibia*, but ſhall ſupply them in their proper place. The advantages of this diviſion will be known to any one who conſults the firſt volume of Linnæus's great *Syſtema Naturæ*. That it ſhould often contradict common language, is not to be wondered at, ſince that aroſe from a groſs ſuperficial view of things. Linnæus, for the term *Quadrupedia*, now uſes that of *Mammalia*, on account of the former excluding the cetaceous fiſhes, which, although they have not four feet, have yet the other diſtinguiſhing properties of the *Quadrupedia*, an heart with two auricles and two ventricles, lungs with which they breathe alternately, *penis intrans*, and, beſides, are viviparous and lactiferous, *&c.*

This claſs is ſubdivided into different orders, and it ſeems doubtful whether any of them are rejected from our food, eſculent animals, (if I may ſay ſo,) in different countries, being taken from every one of them. The *Pecora* are the order chiefly uſed here, and are diſtinguiſhed by being hoofed, ruminant animals, phytovorous, domeſtic, tame, and generally horned. Theſe, from living on vegetables, are perhaps the moſt proper food, and alſo from their being tame and domeſtic. Of the *Pecora*, thoſe more commonly in uſe are the cow, ſheep, goat, and deer or hart. In other countries

countries the reſt may be uſed, as the camel in Africa; and if the muſk-deer be taken in, we have then the whole order.

COW KIND; BEEF, VEAL.

This we uſe as others, in two different ways, *young* and *old*. Beef, compared with mutton, is of a more firm texture, and leſs ſoluble, but I am perſuaded is equally alkaleſcent, perſpirable, and nutritious: If, in the ſouthern countries, it is not eſteemed ſo, it is on account of its imperfection there, as already obſerved. With regard to young and old foods, a great deal has been already ſaid: I ſhall confirm that here, with an obſervation on our uſe of *veal*. If we were purely to conſider tenderneſs of texture, the youngeſt animals certainly would always be preferred; but you obſerve, that we uſe veal at a certain age, and perhaps the reaſon of it may be this; when an animal is very young, although its fibres, taken by themſelves, are more tender, yet, on account of their great connection and complication, they are leſs ſoluble; whereas, in the ſpace of a month or two, by proper nouriſhment, the fibres come to be more and more ſeparated, a greater quantity of cellular ſubſtance is interpoſed, and they are rendered more ſoluble and nutritious: Now, after this period, perhaps after the third month, the animal's nature tends towards robuſtneſs, firmneſs, and rigidity, becoming more fibrous again, and more difficultly diſſolved. When an animal is very young, we commonly have an averſion to it; the whole of it then is, as it were, a ſemifluid maſs, which we cannot take in ſufficient quantity, and which, from its watery conſiſtence, muſt be but little nutritious.

SHEEP KIND; MUTTON, LAMB.

Mutton has commonly been preferred to all the fleſhes of quadrupedes, and indeed, beſides its being more perfect, has the advantage over them of being more generally ſuited to different climates; whereas beef, *e. g.* requires a very nice intermediate ſtate,

which

which it ſeems to enjoy chiefly in England; for although we ſupply what are reckoned the beſt cattle, it is in their rich paſtures they are brought to perfection. Now the ſheep can be brought to almoſt the ſame perfection in this bleak northern, as in the mild ſouthern countries. With regard to the difference between the young and old of this kind, the ſame obſervations occur as under the former head. Lamb appears a more fibrous meat, and, upon that account, is leſs eaſily ſoluble than veal. In this country, houſe-lamb is never reared to advantage.

GOATS FLESH; KID.

The goat, from its own nature, and from its exerciſe in queſt of food, is of a firm fibrous texture, and, with all the advantages art can give it, of very difficult ſolution, and ſo diſuſed in thoſe countries where delicacy of food is introduced. Kid, from its natural rigidity, and the little care beſtowed on its feeding, has all the diſadvantages of any young food in exceſs.

HART, CERVUS; VENISON.

Cervus dama, or fallow deer, is that with which we are beſt acquainted, and uſe moſt, known under the name of Veniſon. This, from the nature of its œconomy, from its wild and exerciſed ſtate, and from being generally killed in the blood, is an alkaleſcent ſapid aliment, conſidered as a very great delicacy, and, though an exerciſed animal, of eaſy digeſtion. Its fleſh approaches very near to that of the ſheep, though undoubtedly it is more ſapid and alkaleſcent.

The ſtag, or red deer, is another of the ſame kind, ſometimes uſed in food, and is a more intractable, robuſt, and exerciſed animal than the other, and conſequently more inſoluble. Perhaps there are others of the *Cervus* kind uſed in food, but I am not yet properly acquainted with them.

After

After the *Pecora* is ſet down in the Catalogue, after ſome interval, the term *Lepus*, one of the *genera* of the *Mammalia Glires* of Linnæus, comprehending the hare and rabbit, which, although their ſpecific difference be ſmall, yet differ a good deal in qualities as food.

HARE.

This animal is much exerciſed, and thereby acquires a great firmneſs of fibres; and, though ſufficiently alkaleſcent, and killed in the blood, is yet of difficult ſolubility. As the tenderneſs of meats depends on the ſucculency of the muſcular parts, the hare killed after a long chace, when much of the oil of the body is abſorbed, is much firmer and tougher than when killed in the ſeat.

RABBIT.

This animal is of very little exerciſe, moderately alkaleſcent, and one of the white meats without viſcidity. Whether on theſe accounts, or ſome particulars in its œconomy, I have always found it one of the lighteſt and moſt ſoluble animal foods.

Next *Lepus*, in the Catalogue, is placed the term, *Sus*, Hog.

HOG; PORK.

This animal is of a peculiar make, and difficultly reduced to any particular order, placed, however, among the *Mammalia Beſtiæ* of Linnæus. It is the only domeſtic animal that I know, of no uſe to man when alive, and therefore properly deſigned for food. Beſides, as loathſome and ugly to every human eye, it is killed without reluctance. The Pythagoreans, whether to preſerve health, or on account of compaſſion, generally forbid the uſe of animal food, and yet it is alledged that Pythagoras reſerved the uſe of hogs fleſh for himſelf. The Jews, the Egyptians, *&c.* and others in the warm countries, and all the Mahometans at preſent, reject the uſe of pork. It is difficult to find out the reaſon of this,

or

or of the precept given to ſome of them, though commonly ſuch as are not given without a particular one. The Greeks gave great commendations to this food; and Galen, though indeed that is ſuſpected to be from a particular fondneſs, is every where full of it. The Romans conſidered it as one of their delicacies; and if ſome of the inhabitants of the northern climates have taken an averſion to it, that probably aroſe from the uncultivated ſtate of their country not being able to rear it. Pork is of a very tender ſtructure, encreaſed perhaps from a peculiarity in its œconomy, *viz.* taking on fat more readily than any other animal. Pork is a white meat even in its adult ſtate, and then gives out a jelly in very great quantity. On account of its little perſpirability and tenderneſs, it is very nutritious, and was given for that intention to the *athletæ*. With regard to its alkaleſcency, no proper experiments have yet been made, but as it is of a gelatinous and ſucculent nature, it is probably leſs ſo than many others. Upon the whole, it appears to me, who am unprejudiced in its favour, to be a very valuable nutriment, and I really do not underſtand why it was in ſome countries forbid. It is ſaid that this animal is very apt to be diſeaſed; but why were not inconveniencies felt on that account in Greece? Again, it has been alledged, that as Paleſtine would not rear theſe animals, and as the Jews had learned the uſe of them in Egypt, it was neceſſary they ſhould have a precept to avoid them. But the Egyptians themſelves did not uſe this meat, and this religious precept, indeed, as well as many others, ſeems to have been borrowed from them. Poſſibly, as pork is not very perſpirable, it might encreaſe the leproſy, which was ſaid to be epidemic in Paleſtine: But this is far from being certain; and though a good purpoſe, as I have ſaid, is commonly intended by ſuch general precepts, yet they often take their riſe from the particular prejudice or caprice of legiſlators.

Many others of the *Mammalia*, or Quadrupeds, are uſed in different countries, and it is not certain which of the Quadrupeds may be excepted from the rule. Thus the Tartars eat horſes, the

Romans eat aſſes, dogs, rats, *&c.* but of theſe, as we have no experience, little can be ſaid, though their qualities may probably be underſtood from the principles already delivered.

We now come to conſider the Claſs of BIRDS, which is divided into ſix orders, *Accipitres*, *Picæ*, *Anſeres*, *Grallæ*, *Gallinæ*, and *Paſſeres*. The *Accipitres* and *Picæ* are carnivorous Birds, and not uſed by us, or indeed much by any nation in food. The other four are what are chiefly uſed, of which we have begun with the *Gallinæ*, as the chief of our domeſtic fowl; and of theſe the firſt, viz. *Gallus Gallinaceus*, is comprehended by Linnæus, under the general name of *Phaſianus*.

The COCK, HEN, CHICKEN, and CAPON,

are entirely domeſtic animals, there being no country, as far as I know, in which they are found wild. They take little exerciſe, live moſtly on vegetables, though ſometimes, indeed, they pick up inſects, and are chiefly delighted with grain. Hence they are a food of tender ſtructure, eaſy ſolution, little alkaleſcency, and, as a white meat, gelatinous. When very young, they are extremely viſcid, when old, tough and ligamentous; ſo that the proper time of uſing them is in a middle ſtate, between theſe two extremes, *i. e.* when about a year old.

A queſtion here ariſes about the feeding of animals, it being doubted whether a crammed, or barn-door fowl, is preferable. Many of our modern arts of feeding, beſides giving more ſucculency and tenderneſs to the food, encreaſe its alkaleſcency: As giving ſucculency, they are an improvement, but, as giving alkaleſcency, a dangerous one, though even with that they make ſolution more eaſy. Exerciſe, however, is neceſſary to give perfection, for, by this means, the fat of the animal is equally diſperſed through the muſcular parts, whereas, when the animal is fatted haſtily, the fat is accumulated in a particular part, *viz.* in the cellular texture,

more

more ſtrictly ſo called; ſo that an exerciſed animal of equal weight, *cæteris paribus*, with a fed one, is much preferable.

The next bird mentioned in the Catalogue, is

The MELEAGRIS GALLOPAVO,

another of the *Gallinæ*, under the generical name of *Meleagris*. The *Meleagris Gallopavo*, or turkey, with regard to its qualities in food, is entirely the ſame as the preceding, being equally tender, ſoluble, and alkaleſcent.

The next bird we come to, is

The PAVO CRISTATUS, or PEACOCK,

which is ſomewhat of a white fleſh, but firm and rigid, and partly from the coarſeneſs of its texture, and partly from its not being prolific, is now properly enough neglected. The Romans formerly uſed, but probably only for ſhow, our Peacock as food. It was remarked that the boiled Peacock would keep very long; but in this there is nothing extraordinary, as was imagined; for the moſt putreſcent part of the food is the fluid, and this, by boiling, is extracted, and leaves only the ſolid fibres behind. Now, if what is called jerking of beef in the Weſt-Indies, or hand-roaſting it, in both which caſes the fluids are not ſo accurately drawn out, have the effect of preſerving meat for a conſiderable time, how much greater muſt that effect be expected to be from the more rigid texture of the Peacock, exſuccated by boiling?

PHEASANT.

Next the Peacock ſhould have been inſerted the Pheaſant, as it is the firſt among the wild fowl; but becauſe Linnæus has given *Phaſianus* as his generical name for the *Gallus Gallinaceus*, &c. it was omitted: Here, however, it ſhall be mentioned, as it is in its

proper place. The Pheaſant is a wild fowl, is more exerciſed, and hence, and from its living on the drier vegetables, and inſects, more alkaleſcent than the tame fowl, and alſo, from its being capable of fattening, is more ſoluble.

The five following belong all to one genus, the *Tetrao* of Linnæus. The two firſt,

TETRAO PERDIX *et* COTURNIX, *i. e.* the PARTRIDGE and QUAIL,

approach in their nature to the tame fowl, but are more ſapid, tender, and alkaleſcent, the chief cauſe of difference reſiding in the alkaleſcency.

The three laſt, *viz.*

The LAGOPUS, TETRIX *et* UROGALLUS,

as living more on inſects, are more alkaleſcent than the two former, much more ſo than the tame fowl.

In following Linnæus, I have omitted

The GROUSE, or RED GAME,

which, however, I meant to comprehend under the term *Lagopus*; although Linnæus does not ſeem to be acquainted with our red game, which, however, is the *Lagopus* of other Naturaliſts, and the *Lagopus altera Plinii*. The qualities of theſe are very much in common. From its ſize, rather than any real difference, is, I imagine, the black game thought more firm, tho' perhaps, from its living on very high mountains, it is ſeldomer got young. I have mentioned young food as viſcid and gelatinous, but theſe of which we are ſpeaking are not ſo, which is an exception to the general rule, and which I impute to the greater alkaleſcency of the kind.

AN-

ANSERES.

Next in order come the *Anſeres* of Linnæus, which term may properly be tranſlated Water Fowl.

From their nature, the water fowl are much exerciſed, and being generally carnivorous, are more alkaleſcent than the tame; whether they are more ſo than the wild fowl, is undetermined. Certain however it is, that, whether from their leſs alkaleſcency, or peculiar nature, they are leſs ſoluble than theſe, ſo that, if we here apprehend a greater alkaleſcency, we muſt likewiſe ſuppoſe a greater viſcidity, which indeed they generally poſſeſs more than the wild fowl.

Linnæus uſing *Anſeres* for the generical term, uſes *Anas* for the gooſe as well as duck; but, for fear of confounding you, I have avoided the ſcientific terms.

ANAS DOMESTICA, the TAME DUCK.

Here Naturaliſts commonly have, although different in their manner of living, conſidered the tame and wild animal as the ſame: However that may hold in natural hiſtory, we muſt make a difference in their qualities, as food. The wild duck is more alkaleſcent, more tender, and more eaſily diſſolved than the tame, and, in general, this difference takes place between wild and tame animals, if they are taken at a ſuitable age and proper ſeaſon. Old animals are generally more alkaleſcent and more eaſily ſoluble than the young: Many animals, however, are not viſcid when young, ſo that, in this caſe, the rule is contradicted. All wild animals, too, differ according to the ſeaſon, either from the time of their molting, or the quantity of food they then get.

The

The next mentioned, is

ANAS MOSCHATA, or MUSCOVY DUCK,

which ſeems to be of the ſame qualities with the former, but ſomewhat of a more firm and leſs tender texture. Firſt when theſe were known here, they were reared with very great care, but are now more commonly neglected.

Of the *Boſchus major*, or Wild Duck, we have already ſpoken, under the *Anas domeſtica*. We go on to the others mentioned in the Catalogue.

The QUERQUEDULA, or TEALE,

is very much of the nature of the wild duck, and is the moſt tender and alkaleſcent, the leaſt viſcid and moſt ſavoury of this kind.

ANSER DOMESTICUS, TAME GOOSE.

This is no leſs alkaleſcent than the duck, is manifeſtly leſs viſcid, but of a firmer texture; its ſolution, however, is not ſo conſtant, depending more on a difference of ſtomach.

CYGNUS, SWAN.

In food, this is now very rarely uſed; in its young ſtate, it is by far the moſt rigid of any of their order: It is of difficult manducation, and ſo far as texture can occaſion that, of difficult ſolution in the ſtomach.

Here I might have inſerted a great many more of the ANSERINE tribe, but I was not ſo well acquainted with them as to point out their difference: They are all wild, and, from their œconomy or food, we may judge of their qualities. As living on fiſh, they are viſcid and alkaleſcent. I have ſet down two, the *Pelicanus Baſſanus*,

or

or *Solan Gooſe*, and the *Alcatorda*, the Murret, or, in England, the *Razor-bill*, which may ſerve for the reſt.

SOLAN GOOSE.

This is one of the moſt alkaleſcent foods we uſe here. It is an animal not much exerciſed, and, when old, inſoluble, but, when young, it is very eaſily ſoluble, and when it agrees with the ſtomach may be taken in large proportion, even in weak ones, as I myſelf have experienced, and though alkaleſcent, gives little inconvenience on that account. It is commonly talked of as a whet to the appetite; but this muſt not be taken ſeriouſly, although, indeed, it is of remarkably eaſy ſolution. All this illuſtrates what has been ſaid on the ſolubility of food depending on its alkaleſcency; and hence, in ſome meaſure, may be underſtood the qualities of other ſea fowl uſed in diet.

GRALLÆ.

The GRALLÆ, the next claſs I am to mention, are much connected with the former, as being aquatic birds, though not always ſwimmers or divers. They live often in marſhy grounds, catching fiſh, inſects, *&c.* They have been called *Limoſugæ*, or Mud-ſuckers, but improperly, as they take up the earth only as it contains inſects, or agitate it with their bills to bring up worms. For walking in marſhy places they are provided with long legs, called *grallæ*, from their likeneſs to thoſe ſticks on which people ſometimes walk, whence their *gradus grallatorius*. I have ſet down a number of different *genera*. *Ardea*, the Heron, and Bittern; *Scolopax*, the Woodcock, Snipe, and Curlew; *Tringa*, the Lapwing, in Scotland the Teachat, and Peaſeweep, and Grey Plover; *Charadrius*, the Green Plover; *Hæmatopus*, the Sea Pye; *Fulica*, the Coot; *Rallus*, the Rail, in Scotch the *Corncraig*; *Otis*, the Buſtard. With a view to their qualities as aliment, I ſhall begin with

The OTIS.

It is doubtful whether this ought to be ranked with the other *Grallæ*, it being a land animal, living on grain, and rather, I believe,

believe, ſhould have been kept with the *Gallinæ*. Its fleſh approaches to that of the partridge, and its qualities are much the ſame with thoſe of the wild fowl of the *Gallinæ*.

I conſider the RALLUS as likewiſe belonging to the *Gallinæ*, though, indeed, a ſpecies of it, the *Rallus aquaticus*, more evidently belongs to the *Grallæ*. In many countries they are conſidered as Quails; and in Italy called the King of theſe, *Il Re di Qualli*. With exception of theſe two all the reſt ſtand properly in the ſame order; but, from certain circumſtances, are of different qualities, *viz.* being inland or not, *&c.*

Of the inland kind belonging to the *Scolopax*, are

The WOODCOCK and SNIPE,

which, although inſectivorous, appear to be leſs alkaleſcent, of a tender ſtructure, approaching to the white meats of the gallinaceous kind.

Here may be illuſtrated what we have ſaid of exerciſe producing firmneſs. The Woodcock is obliged to fly much about, while the Partridge walks more and flies leſs. Hence it is obſerved, that the wing of the Woodcock is always very tough, while that of the Partridge is very tender; and, on the contrary, the leg of the Woodcock is very tender, while that of the Partridge is very tough. Hence the proverb, Give the Woodcock the Partridge wings, he will be the moſt delicate of birds.

CURLEW.

This alſo belongs to the *Scolopax*, but living on fiſhes, and at ſea, is very alkaleſcent, and approaches in quality to the Solan Gooſe.

TRINGA.

The *Tringa* are more alkaleſcent than the Woodcock, but leſs ſo than the *Scolopaces*, who live on fiſh, as being inland birds. A difference

difference occurs in the ſpecies, the Lapwing uſing its wings much, being of a firmer texture; while the Grey Plover, taking leſs exerciſe, is more ſoluble.

The CHARADRIUS, or GREEN PLOVER,

is much more alkaleſcent than the Woodcock or Snipe.

Next come

The ARDEA, HERON, and BITTERN.

Theſe are of a firmer texture than thoſe we have mentioned, and, when old, are of little uſe. In their young ſtate they are commonly fat, ſufficiently ſoluble, alkaleſcent, and of exquiſite reliſh. It would be worth while to examine accurately the qualities of the Heron and Bittern, as we ſhould then know what difference followed from animals of the ſame genus living on fiſh or on inſects.

Thoſe which remain of the *Grallæ* are entirely ſea fowl. The *Hæmotapus*, or Sea Pye, and the *Fulica*, or Coot, with the Curlew, which we have mentioned under *Scolopax*, are more alkaleſcent than the other *Grallæ*, approaching in their nature to the Solan Gooſe.

We now come to the AVES PASSERES of Linnæus, of which we have a very great variety. I have only ſet down four of the *genera*, which ſeem to me to be the chief. It is difficult to ſay whether they have common qualities: Enquiry would probably ſhew us ſome difference, as they were granivorous or inſectivorous.

The COLUMBA, or PIGEON KIND, are hot and alkaleſcent from much exerciſe, perhaps more ſo than any other of theſe who live on grain. When young, they are tender, and of eaſy ſolution.

With regard to the ſmaller birds, the *Alauda*, *Turdus*, & *Emberiza*, the Lark, Thruſh, and Yellow Hammer; of theſe I have but little experience, and of many more which are comprehended under theſe generical terms. There is probably a difference, according to their exerciſe and food. I ſhall only ſay, that when taken at a proper age they are tender, ſucculent, and alkaleſcent.

I mentioned formerly my omiſſion of the AMPHIBIA, which it is here proper to ſupply; as they are of a middle nature between birds and fiſh, the meaning of the term is doubtful. It is commonly applied to animals who live both on water and land, and ſo includes both birds and beaſts. Linnæus's diſtinction is this: The Beaſts have a heart with two auricles and two ventricles, a warm blood, and lungs which breathe alternately; whereas the *Amphibia* have a heart with one auricle and one ventricle, a cold blood, and lungs which breathe arbitrarily. They are divided into three orders,

The SERPENTES, REPTILES, & NANTES.

Of the REPTILIA there are three *genera* employed in food, the *Teſtudo*, Tortoiſe, the *Lacerta*, Lizard, and the *Rana*, Frog.

TESTUDO, TORTOISE.

Of this there are ſeveral ſpecies uſed in food. The green Turtle is now become a famous delicacy. It is of a peculiar nature, having its fat of a green colour, of a remarkable odour, affecting the urine and ſweat, the colour of which laſt is alſo altered. From this it has been ſuppoſed of peculiar qualities. From its odour, *&c.* it might be medicated, but theſe have no effect on its qualities as nutriment. From ſome particulars in its œconomy, from its little motion, and its living on vegetables, it is leſs alkaleſcent than any of its kind, of a very gelatinous nature, and highly nutritious.

Of

Of the numerous *Lacertæ* there are few employed in food. There is only of which I remember, the Guana of the Weſt Indies. This is there eſteemed a great delicacy, and of tender texture. From peculiar antipathy againſt the animal, when in that country, I could not examine its qualities.

As to the FROG, one of its ſpecies is uſed in France, the *Rana æſculenta*. I am ignorant of its qualities for want of particular experience. As far as we can depend on Geoffroy, this animal, from affording little volatile ſalt, ſeems not very alkaleſcent, nor, from others of Mr. Geoffroy's experiments, very gelatinous. But, conſidering the claſs to which it belongs, and from any ſmall examination I myſelf have made of it, it would ſeem in its nature to approach to the Tortoiſe and Guana.

VIPER.

Of the *Amphibia Serpentes*, I know only one ſpecies uſed in food, namely, the Viper. It is ſtill uncertain whether this is to be conſidered as food or medicine. It has been much talked of in the laſt intention, though, in my opinion, it can have little power as ſuch; for medicines are ſuch bodies as alter the ſyſtem *ſuddenly*, without being *conquered* by it. Now Vipers are commonly uſed in broths, and prove very *nutritious*, being continued for a *length* of time. Neither, indeed, is its volatile ſalt, which has been eſteemed a famous remedy, different from that of other animals. Upon all which accounts I conclude that its virtues, as *medicine*, muſt only be in conſequence of its nutritious quality. As a food, from Geoffroy's experiments, I perceive it is ſufficiently ſoluble, approaching in this, and the quantity of juices it affords, to Quadrupeds; and to Fiſhes, in the *gelatinous* nature of theſe juices. Like all the *Amphibia*, it is of an intermediate nature between Quadrupeds and Fiſh, though in its qualities approaching more to the latter. I told you that, for want of other principles, I determined the alkaleſcency of animal ſubſtances from the quantity of volatile ſalt

they afford. The Viper, as affording leſs of this, I conclude to be leſs alkaleſcent than Quadrupeds or Birds.

As in Natural Hiſtory we obſerve one kind by inſenſible degrees paſſing into another, ſo here the *Amphibia* connect the Quadrupeds and Fiſhes. Of theſe the Reptiles, on the one hand, approaching to Quadrupeds; while the *Serpentes*, on the other, come nearer to the Fiſhes. There is ſtill another order of the *Amphibia*, *viz.* the *Nantes*, the ſame which formerly went under the name of the Cartilaginous Fiſhes. I have marked three of theſe at the end of the Fiſhes, *viz.* the *Petromyzon*, or Lamprey; the *Rara batis*, or Thornback; in Scots, Scate; and the *Accipenſer Sturio*, or Sturgeon. There are two or three more *genera* belonging to this order; and the *Squalus*, or Shark kind, is ſometimes uſed in food. I ſaid they were formerly claſſed with the Fiſhes; but Linnæus, conſidering that in their ſkin, lungs, organs of generation, and that in their being viviparous, *&c.* they approached to the *Amphibia*, has very properly ranked them in this claſs. With reſpect, however, to their qualities as food, they are little different from the Fiſhes, though indeed I ſhould ſuppoſe they approached to the other *Amphibia*. They afford a more gelatinous food than any of the Quadrupeds, or *Amphibia*, and probably are more nutritious. As to their alkaleſcency, from the quantity of volatile ſalt they afford, I conclude they are leſs alkaleſcent than the animals above mentioned, and more ſo than the Fiſhes.

FISHES.

After ſaying ſomewhat on the QUADRUPEDS, BIRDS, and AMPHIBIA, I come to the FISH kind. I have only ſet down thoſe which are commonly uſed, though in England perhaps more may be uſed. The firſt of theſe in the Catalogue is the *Canus* of the *Salmo*, of which there are ſix ſpecies. *Salmo ſalar*, the common Salmon; *Salmo trutta*, is the river Trout; in Scots, the bourn Trout; *Salmo hucho*, in the North of England, bull Trout; in Scotland the Lochleven

Lochleven Trout; *Salmo eperlanus*, the Smelt; in Scots, the Sperling; *Salmo thymallus*, the Grayling, or Umber, which is not known here; *Salmo Alpinus*, the Charr, which lives in the coldeſt water in which any animal will live. After theſe follows in the Catalogue another genus, the *Cyprinus*, of which eight are mentioned; *Cyprinus barbus*, the Barbel; *Carpio*, the Carp; *Gobio*, the Gudgeon; *Tinca*, the Tench; *Cæphalus*, the Chubb; *Rutilus*, the Roch; *Alburnus*, the Bleak; *Brama*, the Bream. After theſe is mentioned the genus of the *Perca*, of which the *Perca fluviatilis*, or common Perch. After this comes again the *Gadus*, of which ſix are mentioned, *Ægleſinus*, Haddock; *Merlangus*, Whiting; *Morhua*, a Cod; *Molva*, Ling, *Virens*, in Scotland, Greenback; *Callarias*, in Scotland, the Codling, or Redware, though of this I am not certain. After theſe is the *Cyclopterus lumpus*, the Lump Fiſh, or Sea Owl; in Scots, the Cock Paddle. Next to this follows in order the *Scomber Scombrus*, the Mackerel; *Scomber Thynnus*, the Tunny, or Spaniſh Mackerel; *Trigla cuculus*, the Red Gurnard; *Mugil*, the Mullet; and *Eſox Lucius*, the Pike. Next to theſe come the *Clupea*, of which four are ſet. *Clupea harengus*, the Herring; which I do not know if the Pilcher be the ſame ſpecies; *Sprattus*, the Sprat; in Scots, the Garvey; *Encraſicolus*, the Anchovy; *Aloſa*, the Shad. After the foregoing are ſet down the *Pleuronectes*, of which five are marked; *Fleſus*, the common Flounder; *Solea*, the Soal; *Plateſſa*, the Plaiſe; *Maximus*, the Turbot; *Hypogloſſus*, the Holibut. In England, what is called the Holibut, is in Scotland the Turbot, *et e contrario*.

Before we come to the *Amphibia Nantes*, which were placed here as formerly ranked among the Cartilaginous Fiſhes, are ſet down *Ammodytes*, the Sand Eel; *Muræna Anguilla*, the common Eel; *Muræna Conger*, the Sea Eel; and by miſtake, as ſuppoſed an aliment, *Anarrhichas*, the Sea Wolf.

Of

Of QUALITIES of FISHES in general.

Their *texture* is generally more tender than that of Fleſh, and they have nothing of a fibrous ſtructure. With reſpect to their *ſolution*, after all, the matter does not ſeem determined; for from Geoffroy's experiments it appears, that they give leſs ſoluble matter out of the body than Fleſh. It is however very probable, that the powers of our ſtomach, the fermentation which is excited there, exceeds greatly any power we can apply out of the body; and, ſo far as we are able to judge, they are of more eaſy ſolution than Fleſh Meats. Broths, however, of Fiſhes do not form into a jelly, though there is ſomewhat gluey and viſcid, which, like the young meats, makes them long retained in the ſtomach; yet, after all, I do not find, that even in this caſe of their longer retention and difficult perſpirability, that by ruminant men, if I may ſo call them, they are ſo often brought up as other foods.

The alkaleſcency of Fiſhes ſeems leſs than that of Meats, their putrefaction being ſlower, and their yield of volatile alkali leſs. There is in the ſolution of this food ſomething particular, which is not yet properly enquired into. We uſe oil or butter ſometimes with our vegetable aliment, oftner with Meats, but more frequently ſtill, and in greater quantity, with Fiſhes. This certainly, if properly underſtood, would throw ſome light on ſolution of this aliment, as it ſeems to be a rule followed from ſome inſtigation of inſtinct, rather than precept of reaſon. I formerly ſpoke of the *ſtimulus* given to the ſtomach by the alkaleſcency of Meats, which, at the ſame time, I told you might be produced by viſcidity and long retention there. In the Fiſh kind this is more remarkable, they being a very ſhort time in the ſtomach before they produce heat, fever, thirſt, and ſometimes effloreſcences over the whole ſurface of the body.

You will eaſily ſee, from the difficulty of giving the general qualities of Fiſhes, how little you can expect to be ſaid on particulars.

In

In order to the understanding the qualities of Fishes, they have been considered as differing in being River or Sea Fish, *Saxatiles* or *Limosæ*, *i. e.* those living in gravelly bottoms, or such as, like the Lamprey, lie at the bottom, in the mud, *&c.* But in neither of these divisions do I find any certain foundation for ascertaining the difference of Fishes as aliment. Dr. Cheyne was extremely fond of the distinction by Colour, the White being supposed less stimulant, and the Red more so. In Birds and Quadrupeds this, indeed, will hold; but there are, except the Salmon, few Fishes but what are of a white colour, so that this distinction will go but a little way. As we found a difference in other aliment from a difference of food, the same would seem to take place in Fishes, all of whom are mostly carnivorous; nor does any difference in the kind of animals they eat seem to make any difference in their qualities: The Perch, *e. g.* who eats mites, fishes, insects indifferently, and all of them rapaciously, and indeed, besides, water fowl, *&c.* is not more alkalescent than those who live on insects alone, *&c.* Nor indeed are they to be distinguished entirely from their different *genera*, though that indeed comes nearest the truth of any other of the distinctions. Now we proceed to the particular *genera*.

SALMON.

Most of this genus are *fluviatiles*, or *lacustres*, of a tender substance, sufficiently succulent and nourishing. They are also alkalescent and heating, and efflorescences, *&c.* are as frequent from them as any other fish. The red kind are of a higher relish and alkalescency, the white are soft and gelatinous. Here I may observe, that Linnæus seems to have forgot what are called our Salmon Trout, which are undoubtedly more stimulating and alkalescent, and less gelatinous than those of the white kind.

CYPRINUS.

This genus is of greater variety than the former, drier, and less tendinous, less sapid and heating, and among the fishes of a nature little gelatinous.

To

To theſe in nature approaches the Pearch, which is of firm texture, but tender ſubſtance, eaſily ſoluble, not glutinous, heating, or remarkably ſtimulant.

GADUS.

Theſe are Sea Fiſhes, and thoſe of them we are beſt acquainted with are the Whiting, Haddock, and Cod. Theſe give a gradation in tenderneſs, glutinoſity, and ſtimulus to the ſyſtem, the Cod being the firmeſt, moſt viſcid, and heating of the three.

Fiſhes are often diſtinguiſhed as being more or leſs ſquamous. All thoſe we have mentioned are the ſcaly kind. The *Amphibia* and Eel kind have no ſcales. The Flounder is intermediate betwixt the two. The ſquamous are univerſally leſs glutinous than thoſe without ſcales, eaſier miſcible in the ſtomach, though leſs nutritious. Before the ſquamous I ſet down

CYCLOPTERUS LUMPUS.

The Lumpus Fiſh is remarkably glutinous, without ſcales, approaching in quality to the Eel, and remarkably nutritious to them who uſe it. The *Mackarel* is a drier ſubſtance and leſs nutritious; the Tunny is mentioned here inadvertently, as it is only known in the Mediterranean, and is there ſaid to be more ſucculent and nutritious than the common Mackarel.

TRIGLA CUCULUS, RED GURNARD.

This is a remarkable ſapid Fiſh, of the white kind, ſaid to be conſiderably nutritious, and much valued in thoſe places where it is uſed.

MUGIL, MULLET.

I am not certain if our Mullet be the *Mugil* of the Romans. It certainly has not the exquiſite reliſh for which they valued theirs, and

and ſeems to me to be of a middle between the Carp and Haddock, leſs dry than the one, and more ſucculent than the other. It is ſufficiently ſoluble and nutritious.

ESOX LUCIUS, the PIKE.

This, though rapacious and carnivorous, is yet a dry, little oily and little alkaleſcent food, and one of the leaſt heating of any we take in. We muſt ſuppoſe, then, conſidering theſe qualities of this fiſh, that there is ſomewhat peculiar in their œconomy which gives riſe to them.

CLUPEA.

All this genus, comprehending the Herring, *&c.* are of an oily, ſucculent, nutritious nature, in their heating quality being next to the Salmon, quickening the pulſe to a conſiderable degree.

PLEURONECTES, the FLOUNDER KIND.

This genus comprehends ſeveral ſpecies: They are all of a tender, oily, ſucculent nature, more glutinous than the preceding, but leſs ſo than the following. They are ſet down according to their qualities, the Flounder and Soal more tender, the Turbot and Holybut more glutinous.

EEL KIND.

Some here are without *ſquamæ*, much of the ſame quality with the Viper, viſcid, nutritious, and difficultly perſpirable; by long retention in the ſtomach, heating and oppreſſive. As to the different ſpecies, I am not in a condition to aſcertain the difference.

INSECTA.

This is a claſs little thought of as food. In ſome countries the Locuſts and Graſshoppers are uſed as food. I can ſay nothing

of the Graſshopper, but that it approaches in nature to the Shrimp. The whole of the Crab kind, although different in their claſs, approach in their quality to Fiſhes in not being eaſily diſſolved by decoction, to the *Amphibia* in giving a jellied broth, and again to the Fiſhes in ſtimulating the ſyſtem. They afford little volatile alkali, and to ſome are a very peculiar *ſtimulus*, producing heat, anxiety, and fever. The three mentioned in the Catalogue are, *Cancer Pagurus*, the Crab; *Cancer Gammarus*, the Shrimp; *Cancer Squilla*, the Lobſter.

VERMES.

Theſe were formerly confounded partly with the Fiſhes; for the reaſons of claſſing them ſeparately, *vide* Linnæus, vol. I. *Syſtema Naturæ*. They are of five orders, two only of which are uſed as aliment, the *Molluſca* and *Teſtacea*. Of the *Molluſca*, the firſt ſpecies in the Catalogue is the *Sepia Loligo*, in Scotland the Stocking Fiſh; in England, the Ink Fiſh. With regard to its qualities, it has none but what is common to it with the reſt of the *Vermes*. Of the *Teſtacea* I have only ſet down ſuch as are found on our ſhores, and give for them Linnæus's *trivial* names. After the *Sepia*, I have ſet down eleven of the *Vermes*, viz. *Patella vulgata*, Limpet, Papſhell; *Helix Pomatia*, the Garden Snail; *Buccinum undatum*, the Welk; in Scotland, the Bakky; *Turbo littoreus*, Periwinkle; in North of Scotland, the Black Welk; the Razor, in England; *Cardium edule*, the Cockle; *Cardium echinatum*, prickly Cockle; *Venus Chione*, Gawky in Scotland; *Oſtrea maxima*, Scallop; Clam in Scotland; *Oſtrea edulis*, common Oyſter; *Mytalus edulis*, common Muſcle.

The qualities of the whole of the *Vermes* is nearly the ſame. They are of a more tender texture than any other Animal Food, and thus would ſeem to be of very eaſy ſolution. But they afford, perhaps, the moſt viſcid gluten of any of the Animal Foods, by this means affect the mixture in the ſtomach, and more the laſt digeſtion,

digeſtion, by which they are with very great difficulty expelled. By this means they are among the nouriſhing of Animal Foods; and though as Animal Subſtances they are alkaleſcent, yet they are among the leaſt ſo, and leaſt heating to the ſyſtem.

Sepia loligo & Solen ſiliqua, or Spout, appear to poſſeſs nothing but the common qualities of the *Vermes*.

The four firſt mentioned of the *Teſtacea* are *Univalves*, and the animal inhabiting them of the ſame genus; the laſt four are *Bivalves*, and the animal inhabiting them of the ſame genus, in all called, by Naturaliſts, *Tethys*; ſo that really we have only two animals to treat of. With regard to the Snail, it has the general qualities of the Worms in a high degree, of a tender texture, eaſily ſoluble, but viſcid and imperſpirable. The Garden Snail is not known here as food, but in ſome of the ſouthern countries it is reckoned a delicacy, and very nouriſhing food. Our own Snails are ſometimes boiled in milk, and employed as a medicine in hectic caſes, and I myſelf have ſeen remarkable advantage from them where there were no ulcerations, they ſoon recruiting the emaciated habit; but in caſe of ulcerations, theſe, as well as all other animal food, are very improper. A remarkable inſtance of the nutritious quality of Snails appears in the famine, which happened in this country about ſixty years ago, of two girls being found to be remarkably nouriſhed from Snails alone, while others of the poorer ſort were meagre and half-ſtarved.

With regard to the other *genera*, they are more commonly employed, but ſeem to be leſs tender, and therefore, perhaps, leſs nutritious.

BIVALVES.

Of the *Bivalves*, the moſt common is the common Oyſter: It is among the few Animal Foods we take in raw, and in that ſtate can be taken in much larger proportion, and more eaſily digeſted, than

when dreſſed. Keil and Sanctorius both agree in calling it a food of ſlow perſpirability. Keil ſays it retards perſpiration of other food; but this I confeſs I do not underſtand. On this account they are nutritious, and, though long retained, as little heating as any to the ſyſtem.

The reſt of the *Bivalves* are leſs ſoluble and tender; ſome of them are ſaid to be ſomewhat poiſonous, as the Muſcle and Limpet, but in what part of them this reſides I cannot tell; ſomething, however, is always rejected.

EGGS of BIRDS.

Theſe might have been ſet down after the Birds, but, as they are ſomewhat analogous to the laſt mentioned food, I have placed them here. It is obvious, from their nature and uſe in the nouriſhment of the *fœtus*, that they contain a larger proportion of pure nutriment than any other aliment, as they give no *fæces*; for every other kind of animal food has ſome of its juices gone farther to putrefaction than the *albumen* which is extracted in our ſtomach, which are depoſited in that form. After all, Eggs are not of eaſy digeſtion, and, from the proportion of nouriſhment they afford, cannot be taken in large quantity. Whether the difficulty of digeſtion in Eggs reſides naturally in the viſcidity of the *albumen*, or in the coagulated ſtate in which we take it in, is a queſtion; it ſeems at leaſt to be increaſed by coagulation, as the hardeſt Egg is moſt difficult of digeſtion. I do not think the inſolubility reſides in the Yolk, as ſome have ſuppoſed, for I have known perſons reject the White, and live on the Yolk entirely, which is of different qualities, and deſigned for an after-food. I have already mentioned the inſolubility of the *albumen ovi* out of the body, by heat, *&c.* and ſaid it could only depend on fermentation. Eggs approach to the *Vermes* in viſcidity and difficult perſpirability; they are leſs alkaleſcent than Fleſh, ſome of whoſe juices have always proceeded too far. A proof of the little alkaleſcency of Eggs, is from their being the Animal Food leaſt apt to pall. Some have ſuppoſed bad qualities,

lities, but I know no inſtance of any: They are ſometimes noxious to certain perſons, but this we muſt explain from an idioſyncraſy.

This is all that occurs on the ſubject of Eggs. I ſhould next go on to conſider Medicines, but, before that, ſhall recapitulate a little what has been ſaid on the ſubject of Aliment. From the whole you will perceive, that Aliment is divided into Vegetable and Animal, and that Milk is of an intermediate nature between both, aceſcent as the vegetable, but not liable to its noxious aceſcency; nouriſhing as the Animal, though not liable to its noxious alkaleſcency. The aceſcent Vegetable Aliment ſeems abſolutely neceſſary to the human œconomy, and there are none of the human ſpecies but what employ it. How far we could diſpenſe with Animal Food is uncertain; it ſeems rather uſeful than neceſſary, in order to give great ſtrength, and for ſubſiſtence and long duration of life little proper. Farther, the Vegetable Aliment is never hurtful, except in the *primæ viæ*, and in theſe only of the diſeaſed: Its effects never appear in the blood-veſſels. On the contrary, Animal Food, which is more nouriſhing, eaſily goes to exceſs, and expoſes to danger, readily, by its alkaleſcency, laying the foundation of diſeaſes, and as well as its other qualities, *e. g.* corpulency, obeſity, and putreſcent acrimony.

EFFECTS of ALIMENT on the MIND.

It is plain the delicacy of feeling, livelineſs of imagination, quickneſs of apprehenſion, and acuteneſs of judgment more frequently accompany a weak ſtate of the body. True it is, indeed, that the ſame ſtate is liable to timidity, fluctuation and doubt, while the ſtrong have that ſteadineſs of judgment, and firmneſs of purpoſe which are proper for the higher and more active ſcenes of life. The moſt valuable ſtate of the Mind, however, appears to reſide in ſomewhat leſs firmneſs and vigour of body. Vegetable Aliment, as never overdiſtending the veſſels, or loading the ſyſtem, never interrupts the ſtronger motions of the Mind, while the heat, fulneſs, and weight of Animal Food is an enemy to its vigorous efforts. Temperance, then, does not ſo much conſiſt in the quantity, for that always will be

regulated

regulated by our appetite, as in the quality, *viz.* a large proportion of Vegetable Aliment. So much in general. Vegetable Aliment conſiſts of ſugar and oil, both ſeparately nutritious, but in that ſtate liable to diſadvantages. Sugar is of difficult aſſimilation, eſpecially if its acid is evolved; as then, like the recent fruits, it will be a proper ſubject for the vinous fermentation. Oil is more difficultly mixed, and oily foods more ſo in proportion, as that is more ſeparate. The *Farinacea*, where the oil and ſugar are intimately blended, are the moſt perfect of Vegetable Aliment, and of theſe the *Cerealia*, as you will now eaſily know from their qualities.

Animal Food differs in alkaleſcency and viſcidity. The Quadrupeds and Birds are the moſt alkaleſcent, the Fiſhes and Vermes the moſt viſcid. Alkaleſcency ſeems to depend on the heat of the Animal. The Quadrupeds and Birds have the greateſt heat, the Fiſhes and Worms leaſt. A farther proof of the leſs alkaleſcency of Fiſhes is, that with Animal Food we are conſtantly led by inſtinct to take in Vegetable Aliment. The ſame inſtinct has never led us to take it in with Fiſhes. For experiment ſake, I have ſometimes taken Apples along with Fiſh, and found them to diſturb digeſtion. The fleſh of Quadrupeds and Fiſhes is, on account of its alkaleſcency, more eaſily diſſolved, and ſooner aſſimilated into blood, giving eaſieſt nouriſhment and ſtrength, while on the ſame account it is wiſely ordained that it is ſooner expelled. Fiſhes and Worms, on account of their viſcidity, are more difficultly diſſolved and aſſimilated, retained longer in the ſyſtem, and only heating from their retention, and thus even accumulating the fluids, and affording nouriſhment to the ſolid parts.

ON THE

VIRTUES of MEDICINES.

HAVING finiſhed the ſubject of Aliments, I proceed in the next place to conſider *Medicines*. As introductory to this, I think it neceſſary to tell you the manner of inveſtigating their virtues. As the foundation of what I have to ſay on this, I ſhall take the following Canon from Linnæus, in his *Materia Medica*: *Syſtemate, Qualitate, et Experientia eruitur omnis uſus Plantarum.*

What he here applies to Vegetables, will, in ſome meaſure, ſuit the other Kingdoms. The two firſt qualities he explains more fully in his *Philoſophia Botanica*, where he employs the term *Fructification*, which is the ſame with the term *Syſtem*; for, according to the fructification, are plants ſyſtematically diſpoſed. In giving the qualities of Aliment, I have often alluded to its place in Natural Hiſtory, and ſhall be obliged hereafter to do ſo more in giving the qualities of Medicine. This method of inveſtigating the virtues from the Botanical Diviſions, was long ſince ſtarted by Hoffman, in his treatiſe *De compendioſo methodo, &c.* and before him by our countryman Dr. Blair, in the *Philoſophical Tranſactions, &c.* The Botanical Rules are, however, far from being general; but, as far they go, they ſerve very well for analogy, and it is on this account we ſhall often have recourſe to them. But before you can be acquainted with theſe Rules, it will be neceſſary to give you an idea of Method in Natural Hiſtory in general.

Method

Method in Natural Hiſtory in general, is that by which a production of Nature being preſented, we can proceed to know how it can be diſtinguiſhed from all other productions of Nature, and the name by which *Writers* have diſtinguiſhed it, in order that, by this means, we may arrive at a knowledge of its nature, qualities, and virtues. This is done by collecting natural productions into Kingdoms, Claſſes, Orders, *Genera*, and Species. As to the firſt diviſion, if a ſubject were preſented to me, in which I could obſerve no proper organization, no difference between the containing and contained parts, I would conclude it to be of the *Mineral* or *Foſſile Kingdom*. A Foſſile alſo has no appearance of the *vita multiplicata*, or power of propagating its like. But if there be a difference between the containing and contained parts, and if it have the power of multiplying itſelf, I conclude it is either of the *Animal*, or *Vegetable Kingdom*. Again, to diſtinguiſh theſe, if I find the ſubject fixed, or, when moved, to have no locomotive power, or arbitrary means of moving itſelf, I conclude our ſubject to be Vegetable; for Animals are organized bodies, endued with *vita multiplicata* and a locomotive power, or, if fixed, have the arbitrary power of moving their parts. Theſe are the largeſt collections, and are called KINGDOMS.

Each of theſe is again ſubdivided into Claſſes, *&c.* In order to give a notion of theſe, it will be eaſieſt to take examples from the Animal Kingdom; as with that you muſt, in ſome meaſure, be already acquainted. The Animal Kingdom is divided into ſix *Claſſes*. Linnæus has firſt attempted a diviſion of them into three; from the ſtructure of their heart, and the heat and colour of the blood. The firſt have a heart of two ventricles, and two auricles, and a warm red blood; the ſecond have a heart of one ventricle, and one auricle, with a cold red blood; the third have a heart of one auricle, and one ventricle, with a cold white blood, or, as Linnæus calls it, *ſanies*. If we were to examine theſe ſtrictly, I believe they would not anſwer ſo well; ſo I rather chuſe to take the ſix ſubdiviſions; *viz. Mammalia, Aves, Amphibia, Piſces, Inſecta, Vermes.*

1. The

1. The *Mammalia* have a heart with two auricles, and two ventricles, with a warm red blood, are neceſſarily breathing, having their reſpiration alternate, ſucceeding in a ſhort time; *maxillæ incumbentes*, or jaws laid horizontally on each other, in oppoſition to thoſe which open laterally, and theſe jaws always covered; *penis intrans*, or the parts of generation of the male entering the female, who is always viviparous, provided with breaſts, and ſuckles her young.

2. *Aves*, ſame heart and reſpiration as the *Mammalia*; *maxillæ incumbentes*, but not covered, *exſertæ*, or having the *maxillæ* ſtretched, without the parts of the head; *edentulæ*, or without teeth; the male, too, enters the female, but are without external teſticles. Their females are oviparous, and have their eggs covered with a calcarious cruſt. The whole of them are always covered with feathers, and have only two feet. I ſhall give the reaſon why I did not uſe this in the diſtinction of the *Mammalia*, *viz.* that it did not ſuit to all of them; ſome having, and ſome wanting, four feet.

3. *Amphibia*, have a heart of one ventricle, and one auricle, with a cold red blood. There is ſome doubt with regard to the univerſality of diſtinguiſhing them by one auricle, and one ventricle; but the exceptions are not certain. When I ſay a *cold*, I mean one not much warmer than the ſurrounding medium, whether that be air or water. They have lungs with which they breath arbitrarily; they agree with the two former in *maxillæ incumbentes*; they have two *peniſes*: The females are generally oviparous, though not always ſo; when they are, their *ova* are covered only with a membrane. Their teguments are neither hairs nor feathers. Their feet are too various to be characteriſed.

4. *Fiſhes*; one auricle, and one ventricle, with the ſame blood as the *Amphibia*. They differ from the three former, in not being breathing animals; but inſtead of lungs are provided with *bronchiæ*, which alternately take in and let out water, inſtead of air. They have *maxillæ incumbentes*, no *penis*, all are oviparous,

and their eggs are ſaid to want an *albumen*; a fact which I am very averſe to believe. As to their *tegmenta*, their ſkin is univerſally covered with ſcales, and they have fins with which they ſwim.

5. *Inſecta*; heart with one auricle and one ventricle, hardly a coloured fluid for blood. As to their reſpiration it is uncertain; they have no lungs, but are ſuppoſed to have ſomewhat analogous to them, *maxillæ laterales*, *penis intrans*; they are generally oviparous, whether univerſally is yet undetermined. I believe they are not. As to teguments, they are covered with a hard ſhelly ſubſtance, *cataphracta*, or coat of mail. They are diſtinguiſhed from all the other Claſſes by their *Antennæ*, i. e. horns, or feelers, for directing their way, *&c.* but, indeed, we are not at all certain of their uſe.

6. *Vermes*. Theſe have a heart with one ventricle, and one auricle, *ſanie frigida*. With regard to their reſpiration nothing is determined, as they appear to have nothing analogous to it. As to their jaws they are various. As to their *tegmenta* they are never covered with ſhells; ſometimes, indeed, they have a calcarious covering, ſeparable from the body, and diſtinct from it; they have neither feet nor fins.

This is a ſpecimen of our method of diſtinguiſhing into *Claſſes*. Theſe Claſſes are divided into Orders. Of the *Orders* we ſhall give you an example in the *Mammalia*.

Of the *Mammalia* there are eight Orders. The firſt Order is, ſo many of Quadrupeds, and others which are not, but inſtead of feet have fins with which they ſwim, and are inhabitants of the water: They have the other general qualities of the *Mammalia*. Theſe make a diſtinct Order, the *Cete*. The Quadrupeds are divided into the other ſeven Orders, according to the ſtate of their teeth. 1. Thoſe which have no fore teeth below or above, are called *Bruta*. Thoſe which have them below and not above, are the

the *Pecora*. Thoſe which have only two fore teeth above and below, without laniary, are called *Glires*, &c. &c.

But to take them in the order which Linnæus has placed them: 1. *Primates* have four upper teeth, ſingle *canini*, or laniary. 2. *Bruta* have no fore teeth above or below. 3. *Feræ* have fore teeth both above and below; ſix above, and all of them acute and ſharp, with ſingle *canini*. 4. *Beſtiæ*; theſe have always more than one canine tooth in each jaw. 5. The *Glires* we have mentioned already; as alſo, 6. the *Pecora*. 7. The *Belluæ* have ſeveral fore teeth, which are blunted and obtuſe.

After the *Orders*, the next diviſion is into *Genera*; of which I ſhall give you an example in the *Pecora*, with which you are beſt acquainted. The ordinal character was taken from the teeth, *&c.* the generical characters are taken from the horns. The *Pecora* comprehends ſix *Genera*, the Camel, the Muſk Deer, the Sheep, the Ox, the Stag, and Goat. The two firſt have no horns; the four laſt are horned. The Stag has ſolid horns without a hollow, branching backwards; the other three have their horns hollowed, and are diſtinguiſhed by the direction of theſe horns. The cow kind have their horns turned forwards, *(porrecta,)* &c. *Vide Linnæi Syſtema Naturæ*, vol. i. Laſtly, the *Genera* are divided into ſpecies, which are individuals which Nature has created. Of theſe I ſhall give you an example in the Camel. The whole ſpecies is not known. Four are mentioned by Linnæus: The Camel, Dromedary, *Glama*, and *Pacos*. The Camel has only one bunch, the Dromedary two, the *Glama* has no ſuch bunch on the back, but one on the breaſt; the *Pacos* has no ſuch tophy, or bunches at all, and is more diſtinctly covered with wool. Now to go backwards, and give an example of the whole. Suppoſe an unknown animal, *e. g.* the *Pacos*, was preſented. From its four feet we reduce it to the claſs of the *Mammalia*, from having no teeth in the upper jaw, we trace it to the *Order* of the *Pecora*, from having no horns, we range it in the firſt or ſecond *Genus* of thoſe, we determine it to the firſt of theſe, from its having

more than one *laniarius*, or canine tooth, and laſtly, from its being without *tophi*, and more diſtinctly covered with wool, we bring it to the *Pacos*, the fourth ſpecies of the Camel. When we have thus got its name, we look into books, and find its nature, hiſtory, and qualities. You ſee, then, how uſeful and neceſſary, although ſeemingly laborious, this method of Natural Hiſtory is. From what I have ſaid, you will underſtand what I mean by deducing the virtues of Medicines, from the place they have in Natural Hiſtory; although to confirm you in it, more practice will be neceſſary.

We have now ſpoken of Kingdoms, Claſſes, Orders, Genera, and Species. This laſt is divided into *Varieties*. That is a Variety where the differences or marks by which it is known are not inherent in the ſubject, but depend on the ſoil, climate, *&c.* This takes place in the Animal Kingdom, but is much more remarkable in the Vegetable. In the laſt a variety is diſtinguiſhed in this way, *viz.* if the ſeed put into the ground does not propagate the ſame variety, but comes up agreeing with the ſpecies. Now to go on with this ſubject a little further, I muſt inform you, the Method in Natural Hiſtory is far from being perfect: For many diſputes ſubſiſt among Naturaliſts, about the Claſſes and Orders to which ſubjects ought to be reduced. This depends on the characters aſſumed for arranging them at firſt; *e. g.* If I were to give flying as the fundamental characteriſtic of a bird, this would not be perfect, becauſe there are flying *Amphibia*, &c. We much better than with Linnæus fix the character from the feathers, legs, *&c.* In the firſt method the Bat would be ranked among the Birds: But when we find that it has four feet, is viviparous, *&c.* it is properly placed among the Quadrupeds. Diſputes of this kind have often occurred, and Linnæus himſelf is an example of this. Formerly, *e. g.* the *Cete* was ranked among the Fiſhes, as an inhabitant of the water, *&c.* but now, Linnæus conſidering that, excepting in this reſpect, it agreed entirely with the *Mammalia*, he has very properly ranked it among them; in which opinion Ray long ago agreed with him. In ſhort, if we aſſume as the fundamental character of Fiſhes, that they are inhabitants

habitants of the water, we ſhall take in many *amphibia*, worms, *&c.* into the ſame Order. We muſt have regard to other qualities, as the ſtructure of the heart, *&c.* before mentioned.

There ſtill ſubſiſt many ſuch diſputes among Naturaliſts, with regard to every one of the diviſions I ſpoke of; *e. g.* Klein, of Dantzick, divides Animals according to their claws, while Linnæus's diviſion, you know, is according to the teeth. The Camel, with Linnæus, is in the order of the *Pecora*; with Klein among the Animals of two claws. Linnæus very properly ranked the Camel with the *Pecora*, for beſides the external ſtructure, it agrees with the reſt of its rank in the internal, *viz.* ſtomach, *&c.* whereas merely on account of an agreement in claws, by Klein it is ranked among animals, otherwiſe eſſentially different. This leads you to underſtand the difference between natural and artificial order in Natural Hiſtory. That method is artificial, which brings together Claſſes, *&c.* merely from one ſingle arbitrary mark, or one that ſeemed moſt convenient in diſtributing theſe Claſſes, *&c.* That method natural, which brings into Claſſes, *&c.* ſuch ſubjects as have the greateſt number of marks or characters in common. The artificial method, although ſometimes it may more eaſily enable us to diſtinguiſh *genera*, is yet, on the whole, very troubleſome and confounding; and univerſally, the method which in Natural Hiſtory is moſt natural, will be in practice of the eaſieſt application; for beſides collecting ſubſtances, which agree in external marks, it places together thoſe whoſe internal properties are in common. There are few ſyſtems where we can preſerve the natural method. The *Mammalia* of Linnæus is a very natural Claſs, as indeed moſt of his Claſſes are; but of this Claſs there are no natural orders, but the *Pecora* and *Cete*. The *Feræ* are nearly ſo, but all the reſt are artificial diſtributions; *e. g.* in the *Primates*, which order comprehends Man, the Monkey is properly enough ſet down; for, beſides having four teeth above, *&c.* it reſembles in other internal properties; but the addition of the Bat, which agrees with the reſt of the order only by its teeth, is certainly very unnatural.

tural. In his other Orders, the ſame difficulty is often found, to which only the ſubject of Quadrupeds, by attempting to reduce them to a few Orders (in which, indeed, he is much to be commended) he is perpetually expoſed. Other examples will occur to you, upon looking into the ſyſtem, as in his placing the Horſe in the ſame genus with the *Hippopotamus*, merely on account of its teeth, *&c.*

To apply all this to our preſent purpoſe, which was in giving this ſketch of Method in Natural Hiſtory, chiefly to make you underſtand the difference between natural and artificial method.

Vegetables, in the ſame manner as Animals, are divided into Claſſes, *&c.* In every botanical method care has been taken to aſſume a natural one; but in none has it yet been perfectly obtained: And plants of diſſimilar qualities in nature are often aſſociated together, merely *lege ſyſtematis* as they ſpeak. The inveſtigation of the virtues of plants, from the ſyſtem, is thus ſpoke of by Linnæus, in his *Philoſophia Botanica*. *Plantæ quæ genere conveniunt virtute etiam* conveniunt, *quæ in ordine* naturali *conveniunt* virtute proprius accedunt, *quæ claſſe* naturali *conveniunt virtutibus quodam modo congruunt.* This rule is more exact as you advance to the loweſt diſtributions, for in Nature there is no diſtribution certain, but that of ſpecies; even thoſe of *genera* are much more artificial; and the higher you ariſe always more ſo; and for the application of this rule, as you ſee Linnæus has carefully marked, you muſt alone have recourſe to the *natural* diviſions. He has given theſe, independent of his Claſſes, *&c.* in his *Philoſophia Botanica*, in what he calls his *Fragmenta Methodi Naturalis.* For our purpoſe, then, you muſt only ſtudy Natural Hiſtory in this way, and you may always allow, I mean moſtly, that thoſe ſubſtances, which are in the ſame natural order, are ſomewhat of correſponding virtues.

Thus *Jalap*, *Mechoacan*, &c. are very properly ranged together. In looking over Linnæus's liſt, I find the majority he puts together

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are of the ſame virtues, and perhaps ſhould find ſtill more, if they were all employed in medicine. But often there are exceptions, and Linnæus ranges ſeveral, not without doubt, or *punctu interrogandi?* So much may be ſaid in favour of the general rule. But although as an analogy it will ſerve to direct in the beginning of ſtudy, yet afterwards, on applying it to particular purpoſes, it is found to be fallacious; ſo that always we ſhould be on our guard in uſing it. Cinnamon, Camphire, and Benzoin are ranged together under the *genus laurus.* All theſe, indeed, agree in *aroma,* but their particular virtues are very different. Many examples of the ſame kind occur *, and no order is without exceptions, when even in varieties † the virtues are different, and often in the *ſame part* of the plant; as in the aromatic rind, the bitter ſeed, and acid juice of the ſame Orange, *&c.* Beſides, in medicine we often uſe different parts of the plant of the ſame ſpecies. Thus of *Senna* and *Caſſia,* in the one we uſe the leaves, in the other the bark; parts which are found of different virtues. If the leaves of *Caſſia* were employed, it is probable the general rule would apply ‡. Our preparation alſo of a plant will alter its virtues, by correcting, deſtroying, or abſtracting its acrid parts, an example of which you had formerly in the *Caſſada.*

In my Catalogue I have ſet down my Plants according to the natural order. In how much they contradict the general rule, ſhall be mentioned when I come to treat of them particularly.

There is nothing, about which Phyſicians have been more anxious, than in finding the beſt method of inveſtigating the virtues of un-

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* Moſt of the *Sedums* are mild, but there is one very *acrid.* Among the *Cucumis,* the Colocynth is by far the ſtrongeſt.

† Of this the Bitter and Sweet Almond is an example; one of which is an innocent, mild ſubſtance, and very nutritious; the other, to ſome animals, poiſonous.

‡ The Potatoe, which belongs to the *Genus Solanum,* is another inſtance of this kind; and perhaps the ſame obſervation may be extended to it.

experienced.

experienced ſubſtances. Various have been the methods for this purpoſe; many more than theſe I have mentioned. All the methods I chuſe to employ, are expreſſed in the aphoriſm of Linnæus, which I have already ſet down. I have now explained the firſt means of inveſtigation, *viz. Syſtemate*. I ſhould next proceed to the ſecond means, *viz. Qualitate*; but previous to that, I ſhall take notice of ſeveral other aphoriſms of Linnæus; and firſt of that concerning the ſoil, or, as he calls it, the *locus* of Plants. It is this: *Locus ſiccus ſapidas, ſucculentus inſipidas magis, aquoſus corroſivas reddit.*

This rule, in ſome meaſure, may be admitted like other general rules, but, like them, has alſo a great many exceptions. Thus Rice and Rye, both of them bland nutritious ſubſtances, are exceptions to this rule. Rice muſt grow in ſome meaſure in water; while the Rye delights in a dry ſoil. The *Becabunga* is a very mild plant, the *Hyoſcyamus* one of the moſt acrid; and yet the former grows in watery, the latter in dry ſituations. Even plants of the ſame genus, will, in the ſame ſoil, be very different; *e. g.* the *Perſicaria mitis & urens.* Upon the whole, this rule ſeems to have been taken from a few obſervations, and thoſe chiefly on the order of the *umbellati.* I imagine the two firſt *loci* mentioned, the *ſiccus* and *ſucculentus*, will apply beſt to the ſame plant, growing in different ſoils. Thus an Aromatic in a dry ſoil is in the greateſt perfection, while, tranſplanted to a rich moiſt one, it loſes its fragrancy, and becomes inſipid. This does not apply ſo well to other ſpecies.

Another aphoriſm of Linnæus is ſtill more general: *viz. Lacteſcentes plantæ communiter venenatæ ſunt.* For my part, I have met with no exception to this rule, and even thoſe which have the milky conſiſtence, though without the colour, generally agree with it. Linnæus himſelf gives ſome exception: *e. g.* the *Semifloſculoſæ*, an order of plants, which we had occaſion to mention as uſed in aliment. All theſe give milky juices, but are, however,

however, no certain exceptions; for ſeveral of the claſs are of deleterious qualities; and if thoſe we employed as food, were allowed to attain their full perfection, they would probably be found of the ſame kind. It is on this account that we blanch them, or uſe them only when young. Linnæus, in a note, gives another exception, the *Campanulatæ* *, which in general are milder than the former; but as ſome of them are of dangerous qualities, the general rule ought ſtill to make us cautious concerning them, and all other lacteſcent plants, which are unknown to us.

I now proceed to the inveſtigation of the virtues of plants, *ex Qualitate, i. e.* according to the taſte, ſmell, *&c.* Linnæus, 1. Aphoriſm. here is, *Inſipidæ et inodoræ vim medicam vix exercent.* This rule ſeems to be without any exception; and it is on this account, and not on any proper experience, that many plants are expunged from the *Materia Medica*; as having no taſte or odour, which ſhould point out in them any active qualities; and moſt ſuch, I believe, are employed as aliment. His other general rule, *Sapidiſſimæ et odoratiſſimæ maximam vim poſſident*, I cannot admit ſo indiſcriminately; for the odour of Plants often reſides in a portion inconſiderably ſmall, whoſe effects muſt be very inconſiderable; neither muſt we take the medical virtues merely from the poignancy of taſte, as that often is deceitful. Thus Ipecacuana, a medicine of active powers, has no ſmell; as to taſte, it is very often latent, and not found till long chewed. On the contrary, the Creſs kind, though of conſiderable poignancy of taſte, are endued with very little medical powers, at leaſt not with a *vis maxima.* However, as the want of odour, or taſte, rejects the ſuppoſition of medical virtue, we may, on the whole, conclude, that thoſe which poſſeſs them, have more or leſs of ſuch; the difficulty is to aſcertain the degree.

* Some of theſe enter into our food.

With regard to odours, I find this very difficult, as they are of ſuch infinite variety, and of ſo little reſemblance, as makes it very difficult to reduce them to any general heads, ſo that thence we might derive particular virtues from the different kinds of them. Linnæus has attempted a diſtinction of this ſort. The ſimply fragrant, as the Violet and Wall flower, &c. the *ambroſiaca*, as the *aſperula*. By *ambroſiacæ* he means ſomewhat of a muſk odour, and gives us another example, the *malva moſchata*; which, by the bye, I take to be an evidence of very ſtrong odour, being accompanied with little medical virtue; for this plant is of very inert qualities. Another odour he mentions, is the aromatic, comprehending under it Thyme, Lavender, Saffron, Cinnamon, Saſſafras, *&c.* all theſe are of a diſtinct odour, and any reſemblance they have, is found not to be ſupported by their virtues in medicine, which are found by experience to be very different. Beſides theſe, there is a kind ſomewhat betwixt the fragrant and fœtid, which I would call the *graveolenta*, ſuch as that of Cummin, Coriander, *&c.* The more directly fœtid are as much to be diſtinguiſhed from each other as the aromatic, *i. e.* the difference of the Rue, *&c.* is very different from the ſtupifying odour of Tobacco or Opium, *&c. &c.*

Upon the whole, very little of the medicinal powers are to be determined from the odour. Some degree of it, indeed, may be determined from a very ſtrong one, though even that is often fallacious.

Linnæus's other general rule, *Sapidæ et ſuaveolentes bonæ ſunt; nauſeoſæ et graveolentes venenatæ ſunt*, will be found often to be falſe; nay, in many caſes, the reverſe. Thus, almoſt all the Lily kind, which are certainly *ſuaveolentæ*, are poiſonous, as alſo the Jaſmine; and on the other hand, the nauſeous and fœtid are often without any dangerous powers, while thoſe altogether inodorous often poſſeſs them. Linnæus alſo pretends to ſay, that *ſapida non agunt in nervos, nec olida in fibras muſculares, &c.* This depends on

on a nice, phyſiological diſtinction, and if, as I think, the moving fibres are continuations of the nerves, or at leaſt intimately affected by them, what acts upon the one, will certainly do ſo on the other.

Linnæus's next aphoriſm, *Ambroſiaca analeptica, Fragrantia orgaſtica, Aromatica excitantia, Tetra ſtupefacientia, Nauſeoſa corroſiva,* is very difficult to underſtand, and, were it neceſſary to comment upon it, might eaſily be ſhown to have little foundation in nature.

So much with regard to Smell. Taſte is of conſiderable more uſe than Smell in determining the virtues *a priori*. Authors on this ſubject have generally ſtopt at generalities. Linnæus is very imperfect upon it. Our countryman, Abercrombie, has alſo touched on the ſame ſubject; but from Sir John Floyer's Treatiſe, though at firſt attempted with imperfection, I find I am able to draw the moſt uſeful hints. Having then ſpoken on the ſubject of Syſtem and Quality ſo far as regards Odour (of which having ſaid enough) I go on to

TASTE.

Taſte labours under the ſame difficulties as Odour. The perceptions from the ſame impreſſion vary in Smell remarkably, in Taſte conſiderably ſo. There is not only the ſame difference of what is grateful to one being not ſo to another, but alſo a difference with regard to impreſſion, what is acrid to me being almoſt inſipid to another. It is not with regard to ſweet and bitter, *&c.* that men differ, it is with regard to compound taſtes, in expreſſing which there is no ſmall difficulty; but as this ſubject leads farther than any other to the knowledge of unexperienced ſubſtances, I ſhall attempt, as a foundation for obſervations afterwards to be made upon it, to give ſomewhat of an arrangement of Taſtes.

1. *Inſipid.* This is of three kinds: The watery, mucilaginous, and oily; in all of which we judge properly of the conſiſtence, and not of the impreſſion or Taſte. Of the Taſtes that produce ſapidity, I ſhall firſt take notice of one in common to the whole vegetable kingdom, *viz.* the 2d, the *Herbaceous.* In many plants we have this perception, joined with many others, ſo that, however, the herbaceous lurks under the whole, and in common to the whole plant.

Sometimes again it is *ſimple,* as in Chickweed. The herbaceous is frequently mixed with more or leſs of the oily, poignant, ſaline, called a nitrous taſte, as in raw Beets, and Spinage. Another difference of it belongs to the *Legumina,* called the Pea Taſte, found in the leaves of Peaſe and other *Legumina.*

3. *Acid.* This is ſimple and pure, in ſome fruits of a watery conſiſtence, as Oranges ſeparated from the rind.

4. Next to this is the Auſtere, or Styptic Taſte, as that in galls, or the barks of trees: In which laſt it is as fundamental as the herbaceous Taſte in vegetables. *Acerb* is often confounded with acid or auſtere, but it is properly a compound of both. All fruits in their unripe ſtate are acerb, ſome of them always remain ſo, as Sloes. Between the acid and acerb there are intermediate degrees. Lemons have a degree, *e. g.* of auſterity along with their acid.

5. *Sweet,* e. g. *Sugar.* This is ſeldom pure, and commonly united and confounded with acid, as in the *acido dulces:* And that again has commonly ſomewhat of acerbity along with it. Sweet is alſo united with auſtere, producing what Floyer calls the Fern Taſte. This is obvious in polypody, ferns, *&c.*

6. The next ſimple Taſte is *the Bitter.* This is ſeldom pure, often confounded with acrimony, aromatic, or auſtere. To me an inſtance of the pure Bitter occurs in Gentian.

7. The

7. The *pure Acrid* is difficult to find. An example occurs in Guinea Pepper. When an acrimony is joined to fragrancy of odour it is aromatic. This is more or leſs pure. Cinnamon is an inſtance of the pureſt aromatic. When an acrid is joined with a diſagreeable odour, it may be called fœtid or nauſeous. Some, however, take the nauſeous as a ſimple taſte, an inſtance of which is given in Opium, which is neither bitter nor acrid.

Theſe are all the ſimple Taſtes. Various are the Taſtes compounded of theſe; the auſtere bitter of Rhubarb; the aromatic bitter, as in Orange or Lemon peel; the nauſeous bitter, as in *Aſſa Fœtida*; the peculiar bitter of Floyer, which he calls the ſmoaky or ſooty bitter, and Naturaliſts the *amaro frigida*, as Lettuce, *&c.* the Laurel bitter, which is commonly encloſed in ſhells, as bitter Almonds, kernels of black Cherries, *&c.* the balſamic or terebinthinate bitter, as that of Turpentine, Reſins, *&c.* are examples of compound bitters, and probably the foundation of all their varieties.

Inſtances of compound Acrids occur in the bitter Acrid, as *Curcuma*, the nauſeous Acrid, which is commonly purgative, as Seneka, in chewing of which you have a ſucceſſion of Taſtes, inſipid, ſweet, nauſeous, acrid, which commonly, as I ſaid juſt now, ſerves to diſtinguiſh purgatives.

Compound aromatic Taſtes occur in Ginger. Cinnamon, I have ſaid, is purely and ſimply aromatic; in Ginger the acrimony is more evident with leſs of the *aroma*. It is thus we diſtinguiſh between the acrid aromatic and the aromatic acrid.

The Creſs and Garlic Acrids occur in Creſſes, Garlic, Onions, and others of the Claſs.

This liſt of Taſtes is very far from being compleat. However, I found it neceſſary to give it, in order for a foundation for more accurate diſtinctions, as they are the leading experiments of judging by

by analogy. On the whole, the virtues of ſubſtances accompany pretty conſtantly and regularly their peculiar Taſtes, eſpecially if they are ſimple. In compound Taſtes we ought always to heſitate, for the virtues of a medicine are often found to reſide principally in a very ſmall proportion of ſapid ſubſtance, which, amidſt the confuſion of other Taſtes, will often diſcover itſelf imperfectly and obſcurely, if it is not hid altogether. As to the ſimple Taſtes, the pure auſtere is aſtringent, the ſweet nutritious, and the pure bitter of the ſame virtues with the reſt of the kind; but more of this ſhall be obſerved afterwards, when I come to treat of particular ſubſtances, which in my Catalogue I have ſometimes arranged, according to their uniformity of Taſtes.

COLOUR.

Linnæus has taken in Colour, as varying the virtues of Medicines. His aphoriſm is this, *Color pallidus inſipidum, viridis crudum, luteus amarum, ruber acidum, albus dulce, niger ingratum indicat.* All theſe of Colour is leſs uſeful than the Odour, much leſs ſo than the Taſte, and is very far from being general.

Luteus amarum indicat. I formerly obſerved, the lacteſcent plants, and even ſuch as were of milky conſiſtence, were often poiſonous, and had a degree of acrimony and bitterneſs with them. If Linnæus, then, had ſaid, that the yellow juices of plants were bitter, or acrid, his rule would have been much more general. The yellow Plumb is an exception.

Ruber acidum. This is not founded. It is applicable only to fruits, which, in proportion to their redneſs, have often their acerbity turned to an acid; for many flowers are red, which have no acidity. Several plants which are of a green colour are acid, as Sorrel, *&c.* but theſe Linnæus ſays are only ſuch as turn red in autumn. But ſurely the *Braſſica*, which is of this kind, has in it no acidity, *&c.*

Viridis

Viridis crudum. This obſervation is only relative, being applicable only to fruits, which, in the progreſs of their growth, change their colour with their maturity.

Pallidus inſipidum. This is a ſtill greater miſtake, for pale plants are far from being generally inſipid. Linnæus means here thoſe plants which, being naturally green, attain, by blanching, a white colour.

Albus dulce. This rule is relative to fruits. Thus the white currant is ſweeter than the red. Whether it applies to apples, plumbs, raſps, *&c.* is a queſtion. Certain it is, that the red plumb is as ſweet as the white, *&c.* This rule, as well as the reſt, is of very little uſe.

Niger ingratum. This is far from being concluſive, although when a general rule of this kind leads to an important caution, it ought to be obſerved. Black currants, in contradiction to it, are equally harmleſs with the red.

This finiſhes what I had to ſay on the ſenſible qualities. Another method of examining and detecting the virtues of plants is by their chemical qualities.

CHEMICAL QUALITIES.

From chemical inveſtigation much has been expected; but it is now known little can be obtained. The firſt means of applying Chemiſtry to this purpoſe, is by the diſtillation *per ſe*. It is now known, that the matters hence produced, are the ſame in all plants; their proportion only being different in different ſubſtances. It ſerves, however, to diſtinguiſh between animal and vegetable ſubſtances; the firſt giving a volatile alkali, the ſecond an acid, in the firſt part of their diſtillation. The *fungi*, however, and eſculent muſhrooms, according to Geoffroy, give out a volatile alkali in the firſt part of the diſtillation. If any other ſuch be found, we may conclude them

them among the more putreſcent vegetable ſubſtances, and of peculiar qualities. Chemical analyſis may be employed in ſuch a caſe as the following, *viz.* of an expreſſed juice preſented to us, which has come from abroad. If ſuch give out a volatile alkali in diſtillation, we may conclude that the ſubſtance was very nearly animal, or, indeed, what is more probable, that it had undergone the putrefactive proceſs in tranſportation. With regard to the acid of vegetable, I do not know whether it will bear any application; for not only is it varied in different vegetables, but alſo is not regular, that is, in any determinate proportion to the virtues of the recent plant, that which in its freſh ſtate has leaſt of it, affording ſometimes moſt in diſtillation. The quantity of volatile alkali is alſo much diverſified, but from theſe I am of opinion we might determine the different alkaleſcency of animal food.

If time were allowed me, it is very poſſible I ſhould go through a great number of diſtillations, in order to determine what influence the difference of proportion might have. The experiments of the French Academy are not properly compared on this ſubject, of the proportion of different principles by chemical analyſis. 1. With regard to ſpt. rector. ſome have given it without decompoſition, and allowed it to paſs over unnoticed into the receiver, or allowed to mix indiſcriminately with the other parts. 2. Acid is groſsly eſtimated from the proportion of water; whereas in all caſes it ought to have been determined from a further rectification. 3. Alkali is ſtill more imperfectly computed, being never eſtimated but in ſo far as it appeared in a ſolid form; whereas ſome of it is always in the phlegm, and ſome of it united with the acid into an ammoniacal ſalt. Neither, 4. with regard to the oil is the eſtimate fair. They have always neglected that which is in the charcoal, whoſe blackneſs, *&c.* is often owing to this, and, in my opinion, the diminution it ſuffers of weight in the open air, may always be reckoned as ſo much oil of the ſubject.

Upon

Upon the whole, although this ſubject had been properly executed, it is uncertain what inferences might have been drawn from it; but, as the matter is at preſent, in talking of medicines I ſhall always neglect it.

Another leſs violent Chemiſtry has been propoſed by Lemery, *viz.* Fermentation; but that, in my opinion, would as much alter our ſubjects as Fire.

Another method of inveſtigation has been propoſed from the Eſſential Salts; but this has been ſo little followed, that I do not know what can be drawn from it; and indeed they generally ariſe from a decompoſition: However, if they be in very great proportion, ſome judgment may be formed, as, *e. g.* a large proportion of Sugar may be inferred nutritious.

Laſtly, Solution and Extraction by different *Menſtrua* has been propoſed, but I am afraid on as weak foundations, for diſcovering the virtues of remedies, as any of the former. The *Menſtrua* uſed are commonly Water and Alcohol. The reſinous parts extracted by the Alcohol are ordinarily moſt active, although this is far from being general, as the gummy often are ſo. But this, as leading to, and being the foundation of, the pharmaceutical treatment, I ſhall always inſert from the beſt Authors, and give obſervations in conſequence.

ADSTRINGENTIA.

The diſtribution of particular ſubſtances I have formerly explained: The different Medicines were diſtributed according to the indications, and, if theſe were one and the ſame, according to their common operation on the human body. The order of the ſeveral indications was this: 1. According to their operation on the Solids and Fluids. The operation on the ſolids is divided into two kinds; firſt, as they act on the ſimple ſolid; ſecondly, as on the *ſolida viva*, or the organs of animals, whoſe properties diſappear with life.

With regard to theſe generalities, I need not hint that it is impoſſible abſolutely to be correct, for there is no diſtribution which is not liable to very great difficulty: We have, however, given that which to us ſeemed the beſt, for in the beginning of ſtudy we ought to acquire general propoſitions, afterwards finding out exceptions, or applying them to particular caſes. We now begin with thoſe Medicines which act on the ſimple Solids: Theſe are of two kinds; firſt, as they increaſe; ſecondly, ſuch as diminiſh the coheſion and ſtrength of the ſimple Solid. Thoſe of the firſt kind are what are ſtrictly Aſtringents, called alſo Conſtringents, Styptics, Tonics, Roborants, *&c.* as we have formerly mentioned: This is the ſimpleſt view of them, and what we muſt here neceſſarily take. With regard to this, as well as all other heads, we ſhall endeavour to ſhow their manner of action on the human body, the diſeaſes in which they are required, the particulars wherein they are hurtful, in what manner their virtues are diſcovered to be preſent, and along with that the particular part or parts in which their virtue reſides, which leads us, laſtly, to the Pharmaceutical Rules for their Extraction.

As to the Operation of ASTRINGENTS, ſome people have imagined to themſelves a very ſimple theory. Animal Fibres they ſuppoſed or conſidered as compoſed of ſolid earthy particles, adhering together in a line, by means of a gluten compoſed of water and oil; *vide Boerhaave.* Now, with regard to increaſing the Coheſion of the Fibres, it may be ſuppoſed to depend on the proximity of the particles. If then we inſinuate between each particle another of the ſame kind, we increaſe the Coheſion of the Fibre, and in this manner have Aſtringents been ſuppoſed to act. This theory is very uncertain, and there is no inſtance in other parts of Nature, of increaſing the Coheſion of Bodies in this manner: Even in the Coagulation of Fluids, which is analogous to this, we cannot certainly ſay it is performed by the interpoſition or inſertion of particles of another of the ſame kind. Some appearances, however, ſeem to contradict this: Thus the Coagulation of White of Eggs by Spirit

of

of Wine may be ſuppoſed to be by the inſinuation of the particles of the Spirit of Wine between thoſe of the Albumen, and ſo attracting them to each other. To me it ſeems rather owing to a decompoſition, the Spirit of Wine attracting the Water, and ſo the ſolid parts running together. Coagulation ſeems to be a decompoſition, or a detraction of ſome parts, in the ſame manner as a fluid volatile *alkali* forms with Spirit of Wine an *Offa Helmontii*, by attracting the water of the volatile *alkali*.

A ſimple fibre, then, being compoſed of fluid and ſolid, the coheſion of the whole may be encreaſed, by diminiſhing the watery ſubſtance, or by addition of ſolid. It appears to me, that Aſtringents act more in the firſt way, by exſiccating or abſorbing the fluids interpoſed. Thus the operation of tanning, which is entirely analagous to this, is carried on almoſt entirely by abſtraction of fluids. So much for the action of Aſtringents on the ſimple ſolid fibres. I muſt now obſerve, that it is impoſſible to keep to our firſt reſolution of ſeparating bodies, which act on the ſimple ſolids, from thoſe which act on the moving fibres. Aſtringents, then, muſt have a double action, firſt, on the ſimple ſolid; ſecondly, on the *ſolida viva*, or the fibres of living bodies. If the action was only on the ſimple fibres, it muſt be confined to the part, to which the ſubſtance was directly applied, by abſorbing its fluid, or increaſing its ſolid parts; whereas we ſee the effect propagated to the reſt of the body. Thus, Alum applied to the tip of the tongue, does not ſtop in its action there, but, independent of diffuſion, induces coheſion and corrugation over the whole mouth. If then Aſtringents taken into the ſtomach extend, in a ſhort time, their action over the ſyſtem, I maintain it is owing to their effect on the moving fibres. If then we look to an Aſtringent's action on a particular part, and then its operation over the whole ſyſtem, it is inconceivable, and almoſt impoſſible to alledge, that the doſe can be ſo divided, as to be conveyed to every particular part, or, far leſs, to the morbid part. We muſt, therefore, ſuppoſe ſome other reaſon, and the effect on the ſyſtem is in conſe-

quence of the univerſal ſympathy of the ſtomach; as when we give an Aſtringent internally in an Hæmorrhagy of the *Uterus*, it is impoſſible that a ſmall portion of an Aſtringent can be ſo divided as to be carried there, far leſs that the whole of it ſhould be ſo, to produce this effect. The propagation of virtues, then, as all other effects on the nervous power is ſcarcely explicable, but as innumerable inſtances of it occur, we muſt admit it as a fact.

Hitherto we have only conſidered Aſtringents as acting on a particular part, but they alſo may be conſidered in different lights, *e. g.* certain Stimulants may be aſtringent. Theſe encreaſe the contraction of the moving fibres, and are either tonic or clonic, producing a ſimple contraction which remains, or alternate oſcillatory motions. If ſuch then as produce only that ſimple contraction exiſt, they muſt be Aſtringents. Of this I ſhall afterwards ſpeak under the head of Stimulants. There is another view in which Aſtringents have been taken, *viz.* that of ſtopping encreaſed evacuations. Whatever diminiſhes theſe, muſt be Aſtringents; and it is almoſt impoſſible to ſeparate the ſtopping of Evacuations, from the operation of Aſtringents in this view.

This introduces ſome confuſion, as the means of ſtopping Evacuations are various; 1. Encreaſing the contraction of the lax ſimple fibre; 2. Of the moving fibres; 3. By leſſening the impetus of the blood on a particular part. Here, then, Sedatives are Aſtringents, and Aſtringents Sedatives. Sedatives operate either by diminiſhing the influx of the nervous power, or its mobility, and ſo are what is called refrigerant. In this view farther, then, as Evacuations depend often on too great influx of the nervous power, and that often on mobility induced by acrimony, Demulcents may be aſtringent, as ſheathing the acrimony. There may be farther means of ſtopping encreaſed Evacuations that may be referred to this head. All Obſtructions may depend on two cauſes; either a Contraction of the Solids, or a Coagulation of the Fluids. If any medicines be introduced into the body, which coagulate the fluids, they are certainly Aſtringents.

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So much I thought neceſſary to ſay on the different views in which Aſtringents may be taken. We now go on to conſider

The DISEASES in which ASTRINGENTS are indicated.

Theſe naturally follow from what we have been ſaying; 1. They are indicated in laxity of the ſimple ſolid. This is the object of their operation, which has been moſt commonly conſidered. However, I have a doubt whether this laxity ſo often takes place as is imagined; for the ſtate of the ſimple ſolids ſeems permanent and fixed, or varied ſo inſenſibly and ſlowly by the age of the animal, that for the courſe of a year, far leſs that of months, *&c.* we can conceive very little change of laxity or rigidity of the ſimple fibres produced, or, indeed, remedied, in the ſame time. Wherever we ſee weakneſs, we deduce it from laxity of the ſimple fibres, but this never occurs, except in very few inſtances. Theſe, I think, are ſcarcely more than the following, *viz.* application of Emollients in over proportion to a particular part, an overflow of moiſture, as the diſſolution of even the bones by the Rickets, or an overſtretching, deſtroying the tone of the part. Theſe, however, are but rare caſes, and ſuch laxity of the ſimple ſolids as is commonly imagined, I can neither ſuppoſe or believe; ſo that this indication from the laxity of the ſimple ſolids, very ſeldom takes place. I think Aſtringents ſeldom act by reſtoring this coheſion: I admit, indeed, that they do externally in topical application; but with regard to internal action, I cannot conceive them capable of being applied to the ultimate fibres in the common courſe of circulation. Nor, indeed, can I eaſily ſuppoſe this diſtribution through the ſides of a ſmall artery, whoſe ſides again are ſuppoſed to conſiſt of theſe, diſpoſed along its ſides, *&c.* To me, the Nerves ſeem the ultimate fibres of the human body, through which a fluid is diſtributed by filtration along their ſubſtance, in the ſame manner as in vegetables; ſo that in this view, a very ſmall proportion of Aſtringent may produce a very great effect.

2. Aſtringents

2. Aſtringents are indicated in debility of moving fibres. This manifeſtly often takes place, and may be induced in a month, or a moment, for the motion of the nervous fluids may be arreſted by the leaſt affection. Theſe are the caſes where moſt univerſally Aſtringents are neceſſary, and in which they moſt commonly act.

3. Aſtringents are indicated in encreaſed action of the ſolids. I explained before how an encreaſed action of the ſolids may depend on irritability, and not on encreaſed ſtrength. In all theſe caſes, where encreaſed action depends on the irritability or mobility of the part, Aſtringents act by diminiſhing the impetus of the nervous fluid, and ſo taking off the encreaſed irritability and encreaſed action. As ſpaſmodic affections often ariſe from encreaſed mobility or irritability, Aſtringents, as taking off theſe, have been reckoned Antiſpaſmodics.

4. Aſtringents are more univerſally indicated in encreaſed evacuations depending on laxity of the ſimple ſolids, or mobility and irritability of the moving fibres, in which laſt caſe their action has been commonly confounded with their action on the ſimple ſolids.

5. Another indication is, when Aſtringents have been employed, as in the caſe of wounds. There is no term more frequent than that of Vulneraries, which are commonly Aſtringents. I ſaid formerly, that moſt Vulneraries were built on an imaginary foundation; but conſidering the matter more nearly, I now ſee a caſe, where they may be uſed in ſome ſuch view, *viz.* in thoſe ulcers which are conſequent upon wounds. It is but a late diſcovery that internal medicines promote the formation of *pus* in ulcers; for this purpoſe the Peruvian Bark has been effectually employed, which I conſtantly conſider as more or leſs of an Aſtringent; for in other caſes where Peruvian Bark is uſed, as in fevers, *&c.* other Aſtringents have been ſucceſsfully ſubſtituted, ſo that I imagine in them ſomewhat of a common virtue, and hence we may ſuppoſe, that our Aſtringents, as well as the Bark, may be favourers of ſuppuration

puration in wounds, and that we may, in ſome meaſure, reſtore the term of Vulnerary.

DISEASES, or CASES, where they are contraindicated.

1. They may be hurtful by inducing too great a degree of conſtriction in the ſyſtem, and thus have I known a ſenſe of fulneſs brought on by their uſe, which muſt either depend on an over quantity of fluids in proportion to the ſolids, or on a conſtriction of the ſolids.

2. Exceſs in the uſe of Aſtringents may deſtroy the mobility of the moving fibres, and it is from this effect that they have perhaps been juſtly accuſed of a deleterious poiſonous quality, bringing on palſies, *&c.* and weakneſs and flaccidity may as well appear from taking off the mobility too much, as by any other means. Theſe effects appear in the ſuppreſſion of the natural and neceſſary excretions; ſo that in the uſe of Aſtringents, we ſhould never proceed ſo far, as to hazard the ſtoppage of theſe. I formerly mentioned one principal uſe of Aſtringents to be in ſtopping encreaſed evacuations. Here, by the uſe of Aſtringents, if we proceed careleſsly, we are apt to run into extremes; and there is nothing more difficult in the practice of phyſic, than to judge the degree in which Aſtringents are to be given, without injuring the healthy evacuations, as well as the kinds which are proper. *Materia Medica* writers are very imperfect upon this head, and commonly under each Aſtringent, they tell us it is anti-dyſenteric, and a medicine for the *diarrhœa*, &c. but they always ought to have added theſe two cautions; 1. That Aſtringents never ought to be employed where the morbid ſtimulus or acrimony, which produces or continues the diſeaſe, has not been previouſly evacuated; for then occaſion is given it to ferment, to multiply itſelf, and aſſimilate other fluids to its nature, which will cauſe the diſeaſe to return with accumulated violence; or, if the Aſtringents have been ſo ſtrong as to prevent this effect, it will cauſe the acrimony to fall on other parts of the ſyſtem; perhaps with more dangerous conſequences. This general rule requires ſome nicety

nicety in the application. Too great an attention to the acrimony is not always neceſſary.

Another view of this matter is, that theſe encreaſed evacuations often depend on a determination of the fluids to particular parts, as in a plethoric habit to the noſe, uterus, or lungs, which may be eſtabliſhed by laws of the ſyſtem, or by habits which are equal to theſe laws. If then we uſe Aſtringents here, we may perhaps loſe our labour, or, which is of more importance, by ſuddenly ſtopping the flow of fluids to theſe veſſels, and ſo ſuddenly changing the balance, a determination is made to places of more conſequence, where diſeaſe is of more danger.

Evacuations often take place alſo, in conſequence of a conſtriction of the ſurface, determining a greater flow to the inteſtines. There is no method of remedying this, but by giving way, in ſome meaſure, to the evacuations, or cauſing the determination ſome other way, and till this be obtained, Aſtringents ought never to be uſed. If their determination have not continued ſo long as to eſtabliſh a law, then we ſhould endeavour to return it by the ſkin, its proper emunctory.

Theſe are the chief cautions in the uſe of Aſtringents. There are ſtill two others. One ariſes from this obſervation, *viz.* that although I have ſaid that Aſtringents, when taken into the mouth, extend their action over the whole ſyſtem, yet that their effects muſt be greater in the *primæ viæ*, to which they are immediately applied; ſo that in the exhibition of Aſtringents, we muſt take care not to ſuppreſs the natural evacuations, while we only endeavour to check the morbid. Another caution is, that in all theſe caſes, where theſe Aſtringents are to be employed as Roborants, they ought to be thrown in only in ſmall doſes, and at proper intervals; for in this indication we only intend to give ſuch an aſtriction, as by encreaſing the ſtrength of the veſſels, they may be enabled to propel their fluids properly. Thus when we uſe Wine as an Aſtringent,

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we muſt obſerve this caution; for if we give it in large quantities, ſuch a ſudden conſtriction may be induced as entirely to counteract our intention. We now go to the

MEANS of diſcovering the VIRTUES of ASTRINGENTS.

1. One method of knowing Aſtringents is by their experienced effects in arts, particularly in the art of tanning leather. Several Societies have been employed in finding a variety of ſubſtances, which may be employed in this way; and have accordingly produced a large liſt of vegetables employed, or which *may* be ſo, in this way, beſides the oak bark. We may allow that all the plants which are found in thoſe liſts, may be concluded Aſtringents, and in proportion to the effect they had in the tanning proceſs, may we infer their aſtringent virtue in animal bodies. Here, however, a caution is neceſſary; for ſuch ſubſtances, beſides their Aſtringency, may often be accompanied with other matters, which may render their uſe noxious. Perhaps it may be ſaid that ſeveral of the ſubſtances, given by thoſe Gentlemen in their liſts, were employed on a previous knowledge of their Aſtringency; but this does not contradict what we have ſaid of ſubſtances which anſwered in tanning, being capable of being uſed as Aſtringents, if they poſſeſs no other noxious quality.

2. Another method of diſcovering Aſtringents is by their decoctions, which, thrown into a ſolution of green vitriol, ſtrike a black colour, and form an ink; and thoſe ſubſtances which thus give the blackeſt ink, provided they are not accompanied with any peculiar acrimony, which diſcharges their uſe as Aſtringents, may be reckoned the ſtrongeſt and beſt.

3. Aſtringents are diſcoverable by an auſtere, or acerb taſte. Some are endued with an odour, but this is a ſeparate matter, accidentally accompanying them, and adds nothing to their aſtringent virtue; for true and pure Aſtringents have an acerb, auſtere taſte,

without odour; for when the odour is great, and joined with other ſubſtances, we muſt reject their uſe as Aſtringents.

PARTS of VEGETABLES where ASTRINGENCY is lodged.

I think the *auſtere* Aſtringents are lodged univerſally in the ſolid parts of vegetables, moſt commonly in the bark, frequently in the woods, and ſometimes in the roots, and indeed I imagine there is an Aſtringency in the ſolid parts of all vegetables, and that in moſt it is only accompanied with other parts which prevent our perceiving it. The acerb Aſtringents are found in the fluid parts of plants, and that commonly in the juices of unripe fruits, or perhaps in other unripe juices of plants. The Chemiſts have gone further in aſcertaining where the aſtringent part is lodged. They alledge, perhaps with ſome propriety, that it always reſides in the earthy parts, which they have ſuppoſed, in order to form this Aſtringency, to be joined with an acid. In the acerb Aſtringents ſome acid is found, but in auſtere Aſtringents none ſuch has been found, even on chemical trials, and theſe are indeed ſubſtances which themſelves attract acid. In what part the aſtringent virtue reſides is uncertain. Here, however, I may obſerve one fact, namely, that all Aſtringents act more powerfully in ſubſtance than in decoction, or any other method of preparation; for our ſtomach has powers of ſolution, which out of the body we cannot imitate. Here ſaline Aſtringents are excepted, *e. g.* the vitriols, for it is indifferent in what form they are introduced. It is, however, often neceſſary for the more convenient exhibition, to extract our Aſtringents, and employ them in a fluid form, which leads me to the pharmaceutical treatment.

PHARMACEUTICAL TREATMENT of ASTRINGENTS.

By Newman's and Cartheuſer's Experiments, it appears, that Aſtringents are equally ſoluble in water and alcohol. They ſay a ſpirituous menſtruum is beſt, and that though water extracts more, all

all is not aſtringent which is extracted, but much of other matters adhering. The proof of this, ſay they, is, that the reſiduums of both are equally inſipid. That a ſpirituous menſtruum does it moſt properly appears from this, that whatever water takes up when boiling it depoſits a part of it when cold. This leads us to a rule in the exhibition, *viz.* that all our aſtringent decoctions ſhould either be given when warm, or agitated well together when cold.

I am now to ſpeak of particular Aſtringents. Theſe I have referred to two heads of *Foſſile* and *Vegetable*; abſolutely of different natures.

FOSSILE ASTRINGENTS.

Theſe are ſubdivided into three Claſſes: The *Earthy*, *Saline*, and *Metallic*.

1. EARTHS.

Theſe are a ſet of ſubſtances, which formerly entered into the *Materia Medica* in a conſiderable number, but of late this number has greatly diminiſhed, and very few of them are now employed. All of them may be reduced to theſe three heads: *Bole*, *Clay*, and *Abſorbent Earth*. In the diſtribution of Earths, Naturaliſts have hitherto been pretty much divided. Thoſe who are averſe to employ the chemical qualities in Natural Hiſtory, have ſought for other marks to diſtinguiſh them. Thus Dr. Hill, and ſome others, have diſtinguiſhed them, according as they are more or leſs diffuſible in water, into *Boles*, *Marles*, &c. But this being only a difference in degree, is not a proper diſtinction. Whatever this may be in Natural Hiſtory, certainly in Medicine the diviſion into Abſorbents, and thoſe which are not ſo, is much more convenient. Of the non-abſorbent are the Boles and Clays, of the laſt kind the *Abſorbent* Earths, of which I have given Oſteocolla for an example.

BOLES.

With regard to the term of *Bole*, the application of it has been various at different times. The Boles of the Ancients, *e. g.* the Boles of Galen, ſeem to have been our abſorbent Earths; whereas the Boles we employ, are not Abſorbents; for they are neither ſoluble nor effervesce with acid in the cold. Their variety is very conſiderable, but we need only make one diſtinction of them, that thoſe of the greateſt purity are beſt, and only fit to be employed. They are frequently adulterated; for our Druggiſts ſeldom take the trouble of bringing Boles from Aſia; for we have Boles at home of the ſame quality and virtues, only wanting their colour, which we give them, by making a mixture of the pureſt white Clay and red Ochre, which, however it may be a fraud in trade, anſwers equally well in Medicine. We have been retrenching the Boles; for my part, I think we might altogether reject them. Their virtues are very inconſiderable. Applied to the tongue they give a certain rough taſte, and appear aſtringent. But, in my opinion, it is only an exſiccating quality, drinking up the moiſture of the tongue, for when pure Bole is diffuſed in water no ſuch taſte is obſerved. With regard to Earthy Medicines, which are not ſoluble in our fluids, little effect can be expected from them; and in order to render them fit for medicine they muſt be previouſly combined with acids, either by *nature* or *art*; or if intended to exſiccate, they muſt be given in ſuch a monſtrous quantity as entirely to overload the ſtomach. As to Boles they may contain ſeveral other ſubſtances, which may make them act more powerfully as Aſtringents; *e. g.* Iron, which moſt of our red Boles contain. Perhaps they are already combined with an acid, or if not may be diſſolved by that in our ſtomach, becoming in this way medicated. Many alſo contain Alum, and on this account may be medicated ſubſtances; but in theſe caſes it is only on account of the Vitriol and Alum they contain, and certainly it would be much better to uſe theſe ſubſtances by themſelves, than in ſuch an uncertain manner as they muſt be in thoſe combinations.

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I forgot to mention, that Boles were hardly diſſoluble in acids, except when very concentrated or aſſiſted with much heat, and the Earth of Alum is now known to be furniſhed, by every Bole and Clay, which may be extracted by every acid, even the weak vegetable, and ſo likewiſe by the acid in our ſtomach, in which view likewiſe they only act as Alum.

Another virtue has been attributed to them, chiefly I believe on the authority of Van Swieten; *viz.* that of abſorbing Alkalis, which is deduced from their ſuppoſed power of ſtopping the Dyſentery. But upon frequent trial I have found them to anſwer no better than calcined Hartſhorn. Let us conſider this theory. He ſays, that, as containing a vitriol, they contain a vitriolic acid, of which part may be got by diſtillation. This, however, is very inconſiderable: I have not yet tried how far they may be conſidered as Antiſeptics, in the manner of Dr. Pringle's Experiments.

CIMOLIA.

This, like other terms, has been left undetermined. As it ſtands in our Diſpenſatories, it implies a pure white pipe Clay, and the *Cimolia purpuracea*, a Fullers earth. Theſe are more purely argillaceous than Boles, and freer of any foreign matter. Their effects in Medicine were never remarkable, and they are now diſregarded in preſent practice, though as poſſibly they may furniſh aluminous matter, they may act as Aſtringents.

OSTEOCOLLA.

I have ſet down this as an inſtance of Abſorbent Earths, many more of which will be found under the title of *Antacida*; I am here only to conſider them as Aſtringents. Oſteocolla is a calcarious earth, which has been ſuſpended in water, and afterwards depoſited and concreted in a powdery form, on different ſubſtances, eſpecially the roots of plants, and, from the other matters being ſeparated by putre-

putrefaction, or otherwiſe, called *Oſteocolla*, from its then being like a hollow tube. Hence alſo it was employed in the cure of fractured bones, and hence, probably, too, the ſuppoſition of Abſorbent Earths being aſtringent. In no one inſtance do I think this is well founded. With vegetable Acids they even form a laxative ſubſtance, nor to the taſte do they ſhew any auſtere or ſtyptic quality. Formerly we employed an animal Earth procured from bones, *&c.* eſpecially *Hartſhorn*, which was, when calcined, particularly uſed in aſtringent decoctions, as the *Decoctum album*. Here I ſhall obſerve, that this is an inſoluble ſubſtance, hardly yielding to Acids, and only as uniting with Acids do earths ſeem to act in the human body. Inſtead of calcined Hartſhorn, we have introduced into the *Decoctum album*, Chalk and Crabs eyes, though I am afraid on no very good foundation, as Chalk, united with Acids, has no aſtringent quality, but is rather laxative. Beſides, Dr. Pringle has found them to have a ſeptic quality, *viz.* by abſorbing the acid in the ſtomach, *&c.* which, in ſome meaſure obviates the putreſcency. If, inſtead of theſe, we were to throw in a *Cimolia*, no ſuch effect would be produced; for all clays contain an aluminous Earth, which, although it extracts the Acid in the ſtomach, yet with this forms an Alum, and thus acts as an Aſtringent. However, on the whole, I believe the calcined Hartſhorn preferable to Chalk, *&c.* which we now employ, for although it unites ſparingly with acids, yet part of it is ſtill corroded by them, and acts as an Alum.

SALINE EARTHS.

The chief, and perhaps the only one of theſe, is Alum. This is a ſubſtance with whoſe chemical hiſtory we are but lately acquainted. Formerly it was ſuppoſed the vitriolic acid in Alum was joined to a calcarious earth, and this perhaps, as well as the reaſons before given, contributed to give riſe to the opinion of calcarious earths being thought aſtringent, when joined with acids. But we now know that clay is a compound earth, part of which may be united

united with acids, and that it is with this part and the vitriolic acid, that Alum is formed.

Alum is found native in a fine fibrous form, called then *Alumen plumoſum*. This is ſo ſcarce as to be miſtaken for *Amianthus*, which often in our ſhops is ſubſtituted for it. For the moſt part, Alum is extracted by art from earths, in which nature has lodged it, *viz.* from *pyrites*, ſlates, *&c.* Extracted from *pyrites*, &c. it is called *Alumen rubrum*. Alum is of two kinds. The firſt is a pure tranſparent Alum, the Alum of the northern Countries. The ſecond is of the ſame nature, with reddiſh ſtreaks in it, called Roman Alum, as brought us from *Civita Vecchia*. Wherein the difference of theſe two conſiſt, I do not find that chemiſts have determined. The manufacturers certainly find one; the Roman Alum with Dyers anſwering purpoſes which the Engliſh will not. Phyſicians, too, think the former better in medicine. As to the taſte, it ſhows rather more ſtypticity, but this is inconſiderable, and I make no doubt, that, for medical purpoſes, the common Alum anſwers equally well with the Roman.

VIRTUES of ALUM.

From experience, Alum is found to be a powerful Aſtringent, and perhaps one of the moſt ſafe. Being readily diſſolved, it acts quickly, and is one of thoſe Aſtringents, which extends its action over the ſyſtem; its effects appearing much ſooner than we poſſibly could ſuppoſe them to be, (in conſequence of the circulation) in the part affected. It acts more quickly, and in a ſmaller doſe, than the vegetable Aſtringents, and is leſs deleterious, leſs ſtimulant, and of more general uſe than the metallic. Alum is one of thoſe Aſtringents which we can moſt conveniently employ externally. It is often employed in Inflammations of the Eyes. Alum not only contracts the fibres, but diminiſhes the mobility, ſo that it here acts in two ways, by correcting the laxity of the veſſels, and at the ſame time diminiſhing the impetus of the fluids. The white of egg, with which it is commonly

monly joined for this purpoſe, has been thought to have particular virtues, but in my opinion it has no other in this caſe, than that of giving conſiſtence, and contributing to more convenient exhibition. Alum is alſo uſed for bracing lax and flaccid gums in ſcorbutic habits, for which purpoſe the vegetable Aſtringents have little effect, and the metallic, on account of their bad taſte, ſtrength, *&c.* are improper. Alum is applied with advantage in inflammations of the throat, and *anginas*, where there is much laxity. Sydenham here formerly propoſed the vitriolic acid alone in ſtrong doſes, but beſides the too great ſtrength of his doſes, the vitriolic acid, mitigated by the earth in Alum, anſwers much better.

Externally Alum has been employed to dry up exceſſive excretions of the ſkin, as ſweat in the armpits, with ſucceſs. But here I need not repeat what I have ſaid formerly about the drying up ſuch excretions at all.

Internally it is uſed in Hæmorrhages as an Aſtringent. In Hæmorrhages of the *uterus* it is the ſubſtance we can moſt depend upon. For this purpoſe it is generally employed in the *Pulvis ſtypticus*. The *Sanguis draconis*, with which it was there joined, has been imagined an Aſtringent, but to me it ſeems to have very little of that power, as not being ſoluble in our fluids, and I think an improvement is made in the laſt edition of the *Pharmacopœia Pauperum*, in ſubſtituting for this the *Terra Japonica*. We have loſt the original intention of Helvetius in addition of the *Sanguis draconis*, *viz.* that of forming the Alum into pills, which is often required for more convenient exhibition. It is done by melting the *Sanguis draconis* on the fire, and mixing with it a proper proportion of Alum, and this is the only means of reducing Alum into this form, and the only proper uſe of the *Sanguis draconis*.

Alum may be employed in all caſes where Aſtringents are uſed. In *diarrhœas*, &c. it has been little uſed, but here it might not only act by bracing the inteſtines, but as an antiſeptic, eſpecially if exhibited in ſmall doſes.

Alum

Alum is alſo employed in Intermittent Fevers, as I myſelf have ſeen with ſucceſs. When joined with aromatics, as nutmeg, and given before a fit, I have ſeen it entirely prevent it. Aſtringents have alſo been uſed in Continued Fevers, and here Alum is preferable to the metallic aſtringents.

DOSE of ALUM.

For different purpoſes it has been uſed in different doſes. The higheſt is ʒß. In this large doſe it excites vomiting. It is ſeldom, therefore, adviſeable to give it in ſuch quantity, and doſes of gr. x. will anſwer better, repeated at half an hour's diſtance, or an hour, and in this way have I ſeen it given to the length of ʒj. without vomiting, *&c.* and I have been told of inſtances where it has been carried further. In hæmorrhages, where aſtringents are uſed, which ſhould be when they are very violent, our intention ought to be to moderate, not to ſuppreſs the flux; ſo that in this caſe the leſs doſe of an aſtringent medicine we uſe the better.

LAPIS HIBERNICUS.

This is a peculiar ſlate. Moſt of the ſlate kind contain Alum, which we know by their being deliqueſcent and mouldering in the air, which depends on their containing the matter of *pyrites*, whence Alum may be got. Wherever this ſlate has any of the aluminous taſte, we may employ it as a medicine; but Alum itſelf is much preferable, as we can aſcertain the doſe; for here we muſt give our *Lapis Hibernicus*, encumbered with a load of uſeleſs earth, and therefore it is now properly neglected. The virtues aſcribed to it ſcarce deſerve our attention. It has been ſaid to be uſed with ſucceſs in contuſions with internal hæmorrhagy. Here, indeed, it may act as well as Alum, but certainly that is much better employed; but in reſolving contuſions, neither this, nor any medicine uſed by *Materia Medica* writers, is fit for the purpoſe.

METALLIC ASTRINGENTS.

COPPER.

This is a metal ſoluble in our fluids and in any ſaline ſubſtance. It may be combined by chemiſtry with acids, alkalis, and neutrals. The combinations are all of the ſame virtues. If there is any difference, the combination with the muriatic acid is more aſtringent, and with alkalis in general more ſtimulant than with acids *.

VIRTUES.

It is a powerful ſtimulant, very immediately and in ſmall doſes exciting vomiting, inſomuch as to make it difficult to exhibit it without this effect. Here, then, we have reaſon to be anxious in the choice of the preparation. We ſhould moſtly avoid the combination with acids, univerſally that with alkalis, and prefer the neutral ſalts. In the inteſtines, Copper acts as a purgative, and may be uſed with advantage in hydropic caſes, not only on this account, but alſo on the diuretic quality it poſſeſſes when properly managed. Whether Copper exerts this diuretic quality in the *primæ viæ*, or by being aſſumed into the maſs of blood, I ſhall not determine.

Copper, too, acts as an Aſtringent in ſtopping Evacuations; but we ſeldom can throw it in, without its ſtimulating effects. For this purpoſe, *Ens Veneris* was recommended by Boyle; but afterwards neglected. There has been a diſpute among the Chemiſts, whether Mr. Boyle's *Ens Veneris* was procured from Iron or Copper. Boyle himſelf tells us, that he uſed a pure venereal vitriol, and beſides, it is impoſſible to imitate the properties of the *Ens Veneris* by any preparation of Iron. This preparation is to be conſidered as a combination of Copper with an ammoniacal Salt, and ſometimes with a portion of muriatic acid. This pre-

* The preparation from neutrals and particularly ammoniacal ſalts are much the mildeſt.

paration

paration may be obtained in Chryſtals in the following manner, *viz.* by adding gradually to a ſolution of blue vitriol in water, a volatile alkali, till no longer any cloud appear in the addition; after which, to the diaphanous liquor, pouring on as much alcohol as is ſufficient to ſeparate the water; after which, very elegant ſmall ſapphire coloured* chryſtals will concrete. *Vid. Nov. Act. N. Curioſ.* tom. i. obſerv. 67. This preparation has all the advantages of the other preparation of Boyle's, and never has any of the Copper united with the muriatic acid. Wherever Copper is introduced in this form, it acts as an Aſtringent, and deſtroys the mobility of the nervous power, and ſo is very uſeful in that diſeaſe of univerſal laxity, the Rickets, as Boyle obſerves. It is alſo antiſpaſmodic, and has been preſcribed in the Epilepſy, as I myſelf have ſometimes obſerved, with appearance of ſucceſs; where its action would ſeem to depend on giving a tenſion to the ſyſtem, and deſtroying that irritability on which Epilepſy ſeem to depend. Boyle alſo recommends *Ens Veneris* as an anodyne, when he ſays it acts without the inflammable qualities of opium, the reſtleſsneſs, *&c.* produced. Experience, however, does not ſeem to confirm this.

Boyle recommends Copper in petechial fevers, with *ſubſultus tendinum*, &c. and found that it ſtopt theſe, and brought the fever to a happy iſſue. Van Swieten tells us of a preparation of Copper, which, immediately after taking, produces a *formicatio* over the whole body, without any of the bad effects which occur from the ſtimulating power of Copper, and that it is an efficacious medicine in the Epilepſy. The method of preparation of it has not yet been diſcovered.

Out of the body, Copper kills Worms; but from its ſtimulating powers, it is very difficult to exhibit it internally for that pur-

* By being chryſtallized thus, it is freed from all adhering acid, and is rendered more aſtringent. *Vid.* Dr. Ruſſel.

poſe. A ſingle drop of it, diſſolved in a ſolution of *vol. alkali*, was found to vomit a child to whom it was exhibited.

In external uſe, as a ſtimulant, it acts as an eſcharotic; and, ſtimulating the veſſels, brings on that degree of inflammation which favours good *pus*.

The ancients employed very commonly Copper in this intention, as a digeſtive in ulcers; but on the reſtoration of learning, Mercury being found out, was almoſt only employed for that purpoſe; and ſo has continued to this day. But there are certainly variety of caſes where Copper is more proper than Mercury, and perhaps ſtill other caſes of ulcers, where another metal will anſwer better than either. I ſhall here mention one particular inſtance of a diſeaſe not known in the books of Phyſic, where the effects of Copper were remarkable. A diſorder in this country appeared a good many years ago, with exulcerations of the mouth, and fauces, with ulcers in the tongue, about the anus, and in different parts of the body, reſembling the venereal diſeaſe; but diſtinguiſhed by the different ſloughs of the ulcers*, by the different manner of its appearance, its want of infection from carnal communication, *&c.* Mercury in this diſeaſe was tried with no ſucceſs; but Copper almoſt always effected a cure. I uſed a ſolution of Verdigreaſe, which, applied to the tongue, very eaſily cured the ulcers there, by inducing a good ſuppuration, but as more difficultly applicable to the tonſils, alſo leſs quick in procuring a cure. This then ought to prompt all Surgeons never to diſmiſs a difficult ulcer without trying this remedy.

DOSE of COPPER.

This cannot be aſcertained properly, as ſome perſons will vomit from an exceedingly ſmall quantity. We can only ſay, then, that the doſes ſhould be ſmall, and then, when uſed as an Anthelmintic, ſtill ſmaller.

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* Pinnated to wit.

As

As to the Preparations of Copper, ſet down in the Catalogue, their uſes will be underſtood from what has been already ſaid on Copper itſelf.

IRON.

This is a metallic ſubſtance, which is of more frequent uſe than any other. It combines with moſt ſaline ſubſtances, and is diſſolved by all acids. The vegetable acid, * however, only corrodes it, but extracts all the medical virtue. Iron, then, may be given in ſubſtance, as its medical virtue may be extracted by the acid in the *primæ viæ*. But this is always an uncertain method, as the doſe extracted depends on the quantity of acid in the *primæ viæ*, and as ſometimes ſo much muſt be given, as by its mechanical action to be productive of bad effects. It is always, then, preferable to have the combination made before we exhibit this medicine. With regard to the preparation of Iron in books of Pharmacy, no difference of virtue has been diſcovered by any experiments yet made. There may be, perhaps, ſome difference, if Iron is combined with alkali, but even here no experiment has proved it. All the preparations of Iron, then, turn upon convenience, or elegance. It is often wanted in a powdery form. Lemery's method for this purpoſe is the beſt, *viz.* letting water, about an inch deep, digeſt upon the iron filings, by which means part of them will be converted into a fine black powder, and more, if the operation is continued. This may be ſeparated by ſhaking the veſſel, when the uncorroded filings will ſeparate. Iron combined with the muriatic acid, is the foundation of the tinctures in the ſhops, and ſuits every purpoſe to which Iron may be applied, *v. P. L.* It is very convenient as diſſolving in alcohol, and making a ſort of dulcified ſpirit of ſalt, which gives the combination a very fine flavour. However, the doſe is here uncertain, as a part of the Iron precipitates in keeping. But then the ſame inconvenience attends other ſolutions.

* Vegetable acid is now found to diſſolve Iron.

VIR-

VIRTUES of IRON.

Iron is purely aſtringent, without the ſtimulating qualities of copper, or the deleterious ones of lead. However, neither is it ſo powerful an aſtringent as the one, nor ſo powerful an antiſpaſmodic as the other. The aperient and aſtringent preparations of Iron are the ſame, differing only in degree of virtue. In all caſes of laxity and debility, and in obſtructions and ſlowneſs, proceeding from theſe cauſes, Iron is employed, though other ſimple aſtringents might alſo anſwer the effect. Here we ought to beware of a ſudden aſtriction, which may be attended with bad conſequences, and, therefore, in exhibiting it in theſe caſes, we ſhould give it in ſmall doſes, and truſt to length of time for a cure; and by this means we ſhall avoid thoſe inconveniences, of which Phyſicians often complain in preparations of Iron.

Mineral waters often produce cures, which we in vain attempt to perform by the combinations in our ſhops; even although theſe waters contain nothing but Iron. This is manifeſtly owing to the weakneſs of the doſe; in proof of which we find, that the ſtrongly impregnated waters ſeldom anſwer ſo well, as thoſe weak ones we commonly reject. Iron may be employed as an antiſpaſmodic, and then muſt be uſed in ſmall doſes. Hyſteric caſes are thoſe in which it is commonly uſed, and then ſometimes bad effects attend its exhibition. Different reaſons have been given for this. That given by Carthuſer ſeems not without foundation, *viz.* that often in theſe caſes there are obſtructions of the viſcera, which are confirmed by the uſe of Iron, but that if theſe are removed, it proves a valuable cure. There is another diſtinction which I would make between the Hypochondriac and Hyſteric diſeaſes, which influences our practice very much. The Hypochondriac diſeaſe often depends on a rigidity of the ſolids, is a diſeaſe of the habit, and occurs in the decline of life; whereas the Hyſteric diſeaſe is often attended with a laxity of the ſolids, is often incidental, and is more purely ſpaſmodic. In Hyſteric caſes, the

Iron

Iron may be employed with ſucceſs, while in the Hypochondriac it is hurtful.

Iron has alſo been employed in Intermittent Fevers. Stahl and his followers, laying it always down as a rule, that a Fever being an effort of nature to throw off from the body ſome morbid matter, thought they very ſeldom ought to be ſtopped; and even in Agues, on this account, they have been very ſparing of the Peruvian Bark. They uſed, however, for this purpoſe of Intermittents a very ſubtile Crocus of Iron, obtained in melting Antimony with nitre. We ſhall afterwards find that this acts in the ſame manner as other Aſtringents, and even as Peruvian Bark itſelf.

Iron, as aſtringent, is improper in inflammable caſes. Some Aſtringents are employed in Continual Fevers, but Iron ought to be avoided, as encreaſing the inflammatory diatheſis. This applies to other caſes, where Iron is more commonly uſed, *viz.* in Hæmorrhagies, *e. g.* in the Hæmoptoiſis. This ſometimes may depend on a laxity of the ſolids, but much oftner owes its riſe to an encreaſed impetus of the fluids. This caſe, if not inflammatory, is very nearly akin to it, and the ſame cruſt occurs in the blood as in other inflammatory caſes. Iron, then, in theſe caſes, ought to be given with great caution, for Hæmoptoes are often the conſequence of Phthiſis, or Conſumption of the Lungs. Iron, in theſe caſes, by its ſudden aſtriction may ſtop the flux, but then the inflammatory diatheſis is continued, and often a ſuppuration brought on. Even Alum, *&c.* are not very proper, and bleeding and the antiphlogiſtic method is much preferable.

DOSES of IRON.

Theſe are uncertain, ſmall doſes ought always to be employed, and if a ſtrong aſtriction is neceſſary, we ought rather to manage our Iron in giving it frequently at proper intervals, than by encreaſing any particular doſe.

The

The virtues of *Green Vitriol* will be underſtood from what has been ſaid of Iron itſelf.

HÆMATITES.

This is one of the principal Ores of Iron, which may be extracted from it by the ſeveral acids, and employed in all caſes where Iron is uſeful; but as it is only Iron which is extracted, and to which the Hæmatites owes its virtues, that ſubſtance may be rejected as ſuperfluous.

The ſame obſervation applies to the *Rubrica fabrilis*, another Ore of Iron.

LEAD.

This is not uſed in medicine, except when combined with other bodies. With oil its calces combine and form the common plaſter, which is the foundation of moſt of the reſt. To this plaſter, Lead gives no other property, but that of conſiſtence. Lead unites with the ſeveral acids. For medical uſe the vegetable is commonly uſed, and acts on it as well as the others. The preparations with this acid and lead in common uſe are the *Saccharum Saturni*, *Acetum Lithargytes*, and common *Ceruſſe*.

Externally Lead is uſed as an aſtringent. It diminiſhes the mobility more than alum, *e. g.* in ſore eyes. But let it be obſerved here, that Lead abſolutely deſtroys the mobility of our fibres. Lead has been uſed in eryſipelas, but in general aſtringents are often improper in this caſe, and great caution is to be enjoined in the uſe of Lead, as it often brings on palſy in our fibres. I myſelf have ſeen it produce gangrene in the eryſipelas.

In burns it is often employed in the *Unguentum album*; but if long uſed, it induces flaccidity of the part, and makes the ulcers difficult to heal. Mercury and Lead, combined, have cured ſcrophulous ulcers, where other means had failed; but a caution ought

ought to be obſerved here, *viz.* that if the ſcrophulous ulcers are very numerous, and the Lead be uſed too freely, its exhibition may be attended with bad effects.

Internally Lead is a powerful Aſtringent, and is employed in Hæmorrhages. We muſt, however, always be aware of its deleterious effects.

Every body knows its bad conſequences to the Miners; and the cuſtom which ſome Vintners had formerly of mixing Lead with their wine, in order to obviate its acidity, which indeed it did powerfully, ſhewed ſufficiently its poiſonous effects. In Hæmorrhages, its action is on the nervous power; for it is never given in ſuch quantity as to ſtop the Hæmorrhage by corrugating the fibres, or coagulating the maſs of blood. Its effects being of this kind, have made it to be employed in *Diarrhœas* and *Dyſenteries*, in the *Fluor albus* and *Gonorrhœas*. In all theſe caſes its effects are powerful, ſo that I could wiſh to be able to inculcate its uſe. For a few doſes, if we have occaſion for it, may ſometimes be uſed without bad effects; but if its uſe is continued for any length of time, its bad conſequences will certainly appear.

Saccharum Saturni and *Tinctura antiphthiſica*, into which that certainly enters, have been employed in Continual Fevers, with remarkable ſucceſs, not having ſuch a ſtimulus as the copper, and taking off the nervous ſymptoms, the *Delirium*, *Subſultus tendinum*, *&c.* as may be ſeen in the *Acta Naturæ Curioſorum*. I have no manner of doubt of its efficacy in this reſpect as an Aſtringent, and conſequently an Antiſpaſmodic, but as its effects in any large quantity are ſo pernicious, in ſpite of the recommendations of ſeveral Germans, we ſhould always uſe ſuch a remedy with very great caution.

ZINC.

This is a ſubſtance very little known in medicine. Its effects are certainly not merely aſtringent. Flowers of Zinc have been ſaid by ſome to have been employed, but not by any Authors of note.

As to *Lapis Calaminaris*, the ore of Zinc, and Tutty, which has been ſuppoſed the Flowers of Zinc, the *Cadmia fornacum*, which, however, Neuman raiſes very great doubts about, they are inert ſubſtances; for, boiled in water, they give no impregnation, and with acids have no virtues. In our ointments they have no effect, except as joined with Vitriol and other ſubſtances. The *Lapis Calaminaris*, in Turner's Cerate, ſerves no other purpoſe but taking off the unctuoſity, which in itſelf is hurtful. But for this purpoſe any other ſubtle powder would have the ſame effect.

White Vitriol is a combination of the Vitriolic Acid and Zinc; but has always along with it ſome copper, or iron. It is uſed in ſore eyes. As it contains Zinc, we ſhould be very cautious in its internal exhibition. It has been given as a vomit, and ſaid to have a very ſudden operation, but I have never been able to obſerve this, and certainly its uſe in any conſiderable quantity muſt be attended with very bad conſequences.

VEGETABLE ASTRINGENTS.

We now proceed to theſe; for the Animal Kingdom ſcarcely furniſhes any Aſtringents, except the Animal Earth, commonly called calcined Hartſhorn, be reckoned as ſuch.

With regard to Vegetable Aſtringents, they are of leſs ſudden operation than thoſe of the Foſſile Kingdom.

I imagine Vegetable Aſtringents, as well as all others, act in the *primæ viæ*; but the ſtimulus of metallic Aſtringents, makes their effects

effects much more propagated over the ſyſtem, than thoſe of the vegetable. Applied to the tongue, Vegetable Aſtringents give a much weaker impreſſion, and there is no Phyſician will have recourſe to them for ſtopping Hæmorrhages, upon any exigency. They may indeed exert their powers over the ſyſtem, but then they do ſo, only ſlowly and gradually. Vegetable Aſtringents, when we want them to be efficacious, muſt be exhibited in ſubſtance. This has been little attended to. The reaſon for this method of exhibition is, becauſe we have no powerful menſtruums for their ſolution. We have, indeed, water and alcohol, but the former will not diſſolve one ounce of any Aſtringent without repeated affuſions and decoctions; and with the latter a very great quantity of the menſtruum is requiſite; and, after all, in either caſe, the impregnation is inconſiderable. We do not chuſe to uſe theſe ſolutions for another reaſon, becauſe the means uſed for ſolution have an effect upon the medicine; much heat and long boiling actually deſtroying the aſtringent quality and vegetable texture. Water, too, although it waſhes out the aſtringent quality, when boiling, and ſeemingly ſuſpends it, yet upon cooling, depoſits much of what it had taken up. Upon theſe accounts, Vegetable Aſtringents ſhould, if poſſible, be given in ſubſtance.

Another reaſon not commonly given, why the Vegetable Aſtringents are weaker than the Foſſile, and why they ſhould be always adminiſtred in ſubſtance, is, that the Vegetable Aſtringents may have their texture deſtroyed in our ſtomach, from the fermentation going on there; whereas the Foſſile Aſtringents are not liable to this effect, and can only be hurt by mixture.

There is a curious obſervation of the late worthy Dr. Alſton, *viz.* that the Peruvian Bark, operating in the ſtomach, remains for a long time in the ſolid form in which it is exhibited, and there is great reaſon to believe, that all Vegetable Aſtringents act in the ſame manner. I myſelf have ſeen Peruvian Bark thrown up, unchanged, after having remained in the ſtomach eight days. Hence

if we throw in this, or other Aſtringents, in a fluid form, both becauſe they are liable to paſs eaſily off, and becauſe they are thus more ſubject to the fermentative proceſs, we may often be diſappointed in their ſucceſs. Here alſo is an additional reaſon for the ſudden operation of the Foſſile Aſtringents, *viz.* becauſe they are more quickly diſſolved than the Vegetable. But wherever there is danger from a ſudden aſtriction, and wherever a ſlow operation is required, the Vegetable Aſtringents are preferable, and are univerſally uſed in all ſuch caſes.

Vegetable Aſtringents are recommended in Hæmorrhoidal Swellings and Bleedings, but it is extremely doubtful, how far their uſe is proper. Wherever theſe are the effects of *plethora*, and Nature attempting a diſcharge, we muſt be very ſparing in the uſe of Aſtringents. But this is not always the caſe; they are often in conſequence of a habit induced of coſtiveneſs, where the blood, hindered in its paſſage, is poured out into the cellular membrane, and the *ecchymoſes* there kept up on account of laxity; for it is not owing to a varicous diſtenſion of the veins, as ſome have imagined; for inſpection proves the contrary. In this caſe, where the ſwelling is kept up from laxity, Vegetable Aſtringents may be of conſiderable ſervice. But ſometimes, although theſe evacuations are not natural, yet they are habitual, and when ſuppreſſed ſuddenly, may bring on equally bad effects, as if they were critical; ſo that Foſſile Aſtringents are not to be uſed here, on account of their being apt to induce a ſudden aſtriction. Vegetable Aſtringents, then, are preferable, becauſe they operate ſlowly and gradually on the conſtitution; but even theſe, from a long continued uſe, are liable to bring on a coſtiveneſs, which is abſolutely inconſiſtent, with the cure of Hæmorrhoidal Fluxes. In the exhibition, then, of theſe Aſtringents, we ſhould always take care to obviate this coſtiveneſs they are ſo apt to produce.

Having ſaid thus much of Vegetable Aſtringents in general, I now proceed to talk of particulars; where, indeed, properly we ſhall

ſhall have little to ſay upon each. If you look into *Materia Medica* writers, you will find them, under each particular Aſtringent, telling you, that it is fit for Spitting of blood, *Diarrhœa*, Dyſentery, *Fluor albus*, and every other fancied encreaſed excretion; in order to ſwell up their volumes. They do not always, however, put all of theſe under each particular ſimple, but diſtribute their diſeaſes to peculiar ones, and ſay, that this is good in Dyſentery, that in *Fluor albus*, *&c.* All this, however, is not always merely for oſtentation; for it ſometimes happened that one, accidentally being preſcribed in a particular caſe, was afterwards always uſed for the ſame; although the others might have anſwered equally well. You will not, then, expect that I ſhall follow theſe writers in this method of procedure. I ſhall only mention where a particular Aſtringent is accompanied with ſome other peculiar property which modifies its operation.

You will obſerve here, that I have thrown the ſubſtances into diſtinct *faſciculi*, with blank ſpaces and letters between. Many of theſe ſpaces may be filled up with the name of the natural order of Linnæus.

The firſt eight at *a* belong to the *Senticoſæ* of Linnæus, and is the thirty-fifth order of his *Fragmenta*. This natural order is better eſtabliſhed than many of the others. They are all of one common quality, but ſome of them are not uſed in medicine. I have only ſet down ſuch as are to be found in our Diſpenſatory liſts. If in any place of the world theſe I have mentioned are not to be found, we may ſafely ſubſtitute for them any others of the ſame natural order. With regard to this order, as all the *genera* agree, ſo do each of the ſpecies in virtue; ſo that beſides the officinal ſpecies we may take any one ſpecies of any of theſe *genera*, for the ſame purpoſe. Whence we ſee the extenſive uſe of diſtributing plants according to their natural order in Botany, if this is made up with ſufficient accuracy. It has been common for *Materia Medica* writers to introduce the variety of names, *&c.* under each particular

cular ſubſtance; but I think it is much better to refer you to the late Authors, eſpecially to Linnæus's *Materia Medica*, where you will find his own name, Caſpar Bauhine's name, *&c.* by which means you will be enabled to get the names of other Authors.

Theſe preliminaries thus ſettled, as to the eight plants, at the head of which is *Agrimonia*, they are all of the ſame virtues, which are ſhortly ſummed up in their Aſtringency. They may poſſeſs different degrees of this, but that difference is not aſcertained; in quality they hardly differ. Some of them have annexed to their Aſtringency ſome other qualities, *e. g.* *Argentina* root has a ſweet with its Aſtringency; *Fragaria* more Bitterneſs than any of the others; in *Tormentilla*, *Caryophillata*, &c. ſome *aroma*. Except from Sir John Floyer, I have got very little aſſiſtance in the ſenſible qualities; for Lewis has copied him very inaccurately, or, when he has advanced any thing of his own, has done it imperfectly.

With regard to theſe plants, as they ſtand in our ſhops, the firſt five ſtand in the Edinburgh, and not in the London Diſpenſatory. But neither in the former are they inſerted from any particular virtue, but only from a timidity of rejecting too many ſubſtances; thinking it better, as in ſome editions of the Diſpenſatory it is expreſſed, *copia quam penuria premi*; neither again have the London College expunged them from any noxious quality, but only from their not being uſed in preſent practice; which, by the bye, is far from being a teſt of the inefficacy of medicines. However, it is certainly true, that the three which the London College retain, are certainly the moſt powerful; for we uſe only the herbs of the firſt, whereas the Aſtringency reſides moſt in Barks.

The London College ſtill retain the Roſe, on account of its fragrancy; but certainly *Quinquefolium* and *Tormentilla* are the moſt powerful of the eight ſet down; whether we truſt to experience, or

their ſenſible qualities. As to the ſenſible qualities, in the leaves there is a mucilaginous quality, in the roots the Aſtringency is more pure and entire. *Quinquefolium* and *Tormentilla* are both remarkable Aſtringents, and have the ſame virtue with theſe. The firſt has been uſed by Hippocrates, and ſince his time in the cure of Intermittent Fevers. Many other common Aſtringents have been uſed for the ſame purpoſe. The *Quinquefolium* has a Bitterneſs with its Aſtringency, which is perhaps neceſſary in the cure of Intermittents, as the Bark poſſeſſes it ſo much. The Germans uſe *Tormentilla* for the ſame purpoſe, but join it with Gentian and other Bitters, which they ſay anſwers equally well with the Bark in the cure of Intermittents. *Tormentilla*, and other Aſtringents, have alſo been ſpoken of for their alexipharmic virtues in peſtilential diſorders; that is, in putrid continual Fevers. In Germany, *Tormentil*, &c. have been uſed in the Small-pox; ſo that hence we may ſuppoſe, that other Aſtringents, beſides the Bark, may be uſeful in Fevers, in bringing on ſuppuration.

Tormentilla and *Quinquefolium* may be extracted by water or alcohol, but from either, a ſlight impregnation is procured, and much boiling in water deprives them of ſomewhat of that aſtringency.

DOSE.

Materia Medica writers have commonly under doſed theſe ſubſtances. The medical virtues of the roots are almoſt all lodged in the cortical parts; ſo that when the roots are ſo large, that you can throw away the pith, the doſe may be in a ſmaller quantity, than if we employed the entire root. When thus prepared, they may be given in a doſe of ʒß. or ʒj. and where a more ſudden aſtriction is wanted, we repeat the doſe ſo often, as to give ℥j. in twenty-four hours, as in the uſe of the Bark.

The next ſet mentioned in my Catalogue, are the *Stellatæ* of Linnæus; the forty-fourth number of his *Fragmenta*. It

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is but a ſmall order, even among the Botaniſts. The three ſet down are what are retained in the Edinburgh Liſt. The London College only retain the *Rubia*. They all poſſeſs the aſtringent quality ſo weakly, that they may be rejected. They are conſtantly marked by *Materia Medica* writers as Diuretics. We might reject this as imaginary, were it not ſo conſtantly repeated, and, indeed, by authors of ſome credit; ſo that we ſhould always have this quality in contemplation. To other Aſtringents the ſame property has been attributed; but for my part, I am able to give no reaſon for it. *Rubia* has been lately obſerved to colour the bones of animals who feed upon it. Long ago it was obſerved to have the power of colouring the urine, and by ſome experiments of Dr. Young, it has been alſo found to colour the milk. This ſhews that vegetable ſubſtances penetrate farther, unchanged, into the ſyſtem, than has been imagined. It ſeems to contradict what I was ſaying, of Vegetables undergoing a change in the *primæ viæ*, and having their peculiar qualities deſtroyed. Here we ſee the colouring ſubſtance of the *Rubia* carried through the circulation, and depoſited in the excretions, but how far this retention of colour implies a retention of virtue, I ſhall not ſay. Often the colouring matter reſides in a very ſmall quantity, and diffuſion of ſubſtances often prevents their operation; ſo that the reuniting of the colouring ſubſtance in the excretions is no proof of its being in ſuch quantity in the blood, as to produce any conſiderable effect. Madder is found to change the health of the animal who takes it, making it diſpirited, ſluggiſh, *&c.* Hence, then, we ſee it certainly exerts powers over the ſyſtem, and whatever has the power of even hurting, may be of uſe in medicine. But with regard to the *Rubia*, as it requires very large quantities, it cannot be uſed, and its doſe is uncertain. *Rubia* has been recommended in the Jaundice, but may ſafely be rejected, with many other medicines recommended for the ſame malady; and there is no tribe of Medicines which may more ſafely be ſo, than thoſe recommended for this purpoſe. Now we know that this diſeaſe depends ſo often on ſtones in the biliary duct,

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and can only be cured by ſolution or evacuation, and as very few medicines can produce this effect, we cannot ſuppoſe the *Rubia* of any conſequence in this diſeaſe. The cure of the Jaundice is almoſt always ſudden, from the ſtone being evacuated, and hence it is that many medicines have been ſuppoſed to cure the Jaundice, from their being luckily given when that effect happened. The cure, then, of this diſeaſe, muſt depend on ſolution, or evacuation. For the former, we have yet no remedies; for the latter, the *Rubia* can have little effect, and it muſt be attempted by Emollients, *&c.*

The next order in my Catalogue, is the *Vaginales*, the twenty-ſeventh order of Linnæus. The firſt plant of this order mentioned by him (the *Laurus*) is improperly arranged; as it differs from the reſt both in habit and virtues; indeed, the whole Plants of this order* do ſo pretty much; for which reaſon I have given thoſe of my liſt officinal names.

With regard to this ſet of Plants, they differ alſo in another way, many of them containing an Acid beſide their Aſtringency, and in this ſet of plants we have the different gradations of acid, auſtere, and acerb. The Aſtringency is lodged chiefly in the roots, the more pure Acidity in the leaves. In the roots alſo there is frequently, more or leſs of a purgative quality, moſt remarkably in the *Rheum*, though in ſome degree alſo in the *Lapatha*, or Dock kind, ſo much a-kin to it. There has been a diſpute about this purgative quality in the Dock kind. Their Aſtringency in this country is often ſo great, as to overpower that effect, but this does not at all refute the truth of that aſſertion; and I myſelf have ſeen Monks Rhubarb, given in ſufficient quantity, produce that effect. The *Biſtorta* of all theſe Plants contains the ſimpleſt and pureſt Aſtringency, and therefore is of moſt frequent uſe as an Aſtringent.

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* Some ſpecies *e. g.* of the *Perſicaria* (which is but a ſpecies of the Biſtort) are extremely acrid, while others are more mild

Aſtringents are frequently of uſe in Scurvy. The *Vaginales* are more frequently employed for this purpoſe, though at the ſame time there are inſtances of the others being employed in the ſame way, which prevent our thinking that this virtue in them is peculiar. In theſe, however, their Acidity may add to their effect; for that, either ſeparate or conjoined into Acerbity, is found moſt appropriated to the Scurvy. Here the vague and undetermined notion of the Scurvy has occaſioned confuſion in the *Materia Medica*. This term has been transferred to many cutaneous diſeaſes, which are of a very different nature, and with whoſe nature we are not ſo well acquainted. When I ſpeak of the Scurvy, I always mean the Sea Scurvy.

The Itch has been ſuppoſed one of the Scorbutic diſorders, and Aſtringents have been accordingly applied, as the *Oxylapathum* in our *Ung. Antipſoricum*; but on repeated trials, I maintain it has no ſuch virtues. In general, Aſtringents are improper in all thoſe cutaneous eruptions, which are in the leaſt degree critical, or an effort of Nature to throw out the offending cauſe to the ſurface.

PHARMACEUTICAL TREATMENT.

All theſe Aſtringents may be employed in ſubſtance, but they are, too, among thoſe which may moſt properly be given in ſolution. Water in decoction extracts their virtues, Spirit has little effect. As to Rhubarb, and its treatment, we ſhall afterwards talk of it.

FILICES.

Theſe are the ſixty-fourth of the *Fragmenta*. Of theſe, I have only ſet down what remain now in our Diſpenſatories; though formerly, many more of the ſame order were inſerted. As to their ſenſible qualities, I know little of them. Floyer has diſtinguiſhed a taſte, inherent in this order, called the *Ferny taſte*; by which he underſtands more or leſs of a Sweetneſs, joined with Aſtringency. If it be true, as is by ſome alledged, that this Sweetneſs is ſo great, that

that the roots have been employed in times of ſcarcity, as food; we cannot ſuppoſe them very efficacious, as medicines. But, though ſome of theſe may thus be employed, yet many are too aſtringent to be nutritive, and many have a ſenſible acrimony. *Polypody*, one of theſe, on account of its acrimony, is transferred to the purgatives; and as this quality is very ſenſible in one, we ſhould always conſider that it may be in the others. It is ſaid, and in ſome meaſure vouched, that the roots of ſome of our plants have been uſeful in deſtroying Worms. At firſt view, this would ſeem to be owing to their acrimony; but we know that ſimple ſweets, as wort, *e. g.* have been efficaciouſly employed for the ſame purpoſe. From their Aſtringency they ſtrengthen the tone of the inteſtines, ſo that it is doubtful whether Ferns are an Anthelmintic, from their ſweetneſs, acrimony, or aſtringency. The Ferns ſeem to me chiefly to be conſidered as Aſtringents, of which, in general, they have had all the virtues aſcribed to them; as curing Rickets, Scurvy, Spaſmodic complaints, *&c.* All theſe effects are intelligible, and may be explained from their aſtringency. Some others are aſcribed to the *Filices*, or capillary plants, which I cannot underſtand, *e. g.* their pectoral virtue. Thus the *Adianthus* has been conſtantly reckoned; for which we have ſubſtituted our native *Trichomanes*. However, although I cannot explain the virtue, to reject what has been ſo conſtantly affirmed, would be dangerous. We may with more ſafety reject their hepatic and ſplenetic virtues. How medicines act on theſe *viſcera*, is at all times very difficult to explain, and a ſpecific virtue is perfectly unintelligible. If the liver or ſpleen are ſpaſmodically affected, the Ferns, as Antiſpaſmodics, may be uſeful, but that they can take down the Spleen, or make it diſappear altogether, is a mere chimera. Other Aſtringents have been employed in checking Catarrhs, and indeed there is one caſe afterwards to be mentioned, where Aſtringents are the only efficacious medicines. A third effect aſcribed to the Ferns, and many other Aſtringents, is that of acting on the urinary paſſages as nephritic Diuretics, Lithontriptics, *&c.* It is enough here to mention this: I ſhall afterwards talk of it more fully.

MUSCUS, LICHEN KIND.

This is not in our preſent Diſpenſatories, but was formerly in all of them. The term is ambiguous. If we take it in the botanical ſenſe, as comprehending all the Moſſes, it will not apply; as many of theſe have a ſtrong acrimony, *&c.* Here the term *Muſcus* ſtands for the ſeveral ſpecies of what are called *Lichens*, which are plainly aſtringent, and recommended in diſeaſes of the breaſt. I have ſet it down chiefly for an obſervation on the Cup-moſs, or *Muſchus pyxidatus*. I take this from Willis, a man much employed in practice, who, on account of his exploded theories, is, perhaps, too much overlooked. He candidly owns, that the Chin-cough is a diſeaſe, in which the Phyſicians, he ſays, ſeldom, the old women often ſucceed. The Cup-moſs, he ſays, is the chief of the empiric remedies, and I myſelf have ſeen it uſed with ſucceſs. Other Aſtringents have alſo been employed for the ſame purpoſe. The Bark has been recommended by Burton, and, on trial, I have found it to anſwer with ſucceſs, but it is generally very difficult to make the child ſwallow the proper quantity; and it would be much eaſier to exhibit the ſimple Aſtringents, where there is no bitterneſs, as the Cup-moſs.

ACIDO AUSTERE, or ACERB.

We have now finiſhed thoſe Aſtringents which can be ranged in botanical order; I have, therefore, next purſued the analogy of the ſenſible qualities. The number of the *Acido-auſtere* might have been much increaſed, by adding all unripe fruits; but I have confined myſelf to ſuch as have this quality in their ripe ſtate. If more had been added, we might ſtill have ſaid, that they had all the ſame virtues, and only differed in degree. The one moſt eaſily procured (which will always be a cauſe of preference, eſpecially as I imagine it is one of the ſtrongeſt,) is the *Prunus ſylveſtris*, or common Sloe. Indigenous plants ſhould always be preferred to exotics, on account of our certainty of their genuineneſs, which is far from being the caſe with the other; and, indeed, in moſt caſes, they are of ſufficient efficacy;

efficacy; though from all this I would not have you conclude, that I think the general rule, of Nature's having given to every particular country remedies adapted to all its diſeaſes, to be true. I ſhall only mention the Sloe, as I think it may ſerve for all the reſt. In the Edinburgh Diſpenſatory, an Extract is ordered to be made of this; in the London, a Conſerve. As it is a ſubſtance that acts more on the *primæ viæ*, than in remote places, its acerbity will, perhaps, make it preferable, in the Dyſentery, to the more pure auſtere. *Diarrhœas*, though *ſeldom* epidemic ones, may be brought on by eating too much ripe fruits; to obviate whoſe effects the acerb will be proper; but then they muſt be ſuch as are not liable to a fermentation; ſo that when ſweetneſs, the cauſe of fermentation, is joined, thoſe will be improper, and they ſhould be more acerb than ſweet. The preparation, then, of the London College, by adding three parts of ſugar, is certainly wrong; neither is that of Edinburgh without its diſadvantages; for, by long continued coction, the aſtringency is apt to be deſtroyed, and, if the extract be dried, towards the end of the proceſs, it is rendered a very difficultly diffuſible ſubſtance. In my opinion, a medium is beſt. It ought to be made like elder-rob, boiled to a certain height, and then ſome ſugar added, to keep it diffuſible. This method of treatment will apply to other ſubſtances.

Next follows in my Catalogue a miſcellaneous liſt, containing ſubſtances that have been employed for the ſame indication, which have no particular analogy, either in botanical characters, or ſenſible qualities. Aſtringency is a very univerſal property in vegetables, and in all the ſolid parts of theſe, as I formerly hinted, there is more or leſs of this quality. The liſt here might have been very much increaſed, but I have only inſerted thoſe ſubſtances that have it in the greateſt purity, and little of any counteracting quality.

ANCHUSA, ALKANET.

Theſe belong to the *Aſperi folia*. I imagine all theſe have more or leſs of an Aſtringency; in few, however, it is conſiderable. From their

their conjoined mucilaginous quality, they have been transferred to the claſs of Demulcents *.

BALAUSTINA, BALAUSTINES.

Theſe are the flowers of the Pomgranate. Theſe are very pure and ſimple Aſtringents, though not ſuppoſed one of the ſtrongeſt. With regard to its uſe, it is one of thoſe that give out an elegant tincture, which, in general, is more eaſily extracted from flowers than from wood; this it yields to water, and ſcarcely at all to ſpirit, ſo that Decoction is the beſt preparation of it.

BRUNELLA, SELF-HEAL.

This is a very weak Aſtringent, though recommended by *Materia Medica* writers. Both from its taſte, and the claſs to which it belongs, *viz.* the *Verticillatæ*, the moſt of which are acrid and ſtimulating, *&c.* we muſt not expect from them any material Aſtringent.

HYPERICUM, St. JOHN's WORT.

Although, formerly, repeated teſtimonies have been given in favour of this plant, yet it is ſcarce at all regarded at preſent. I think we ſhould not be ſo audacious as to neglect it, for by the ſenſible qualities it appears active, which always muſt be a rule to ſuſpect and enquire into its virtues. To the taſte it is aſtringent, with a bitterneſs, which is commonly very conſonant to an aſtringent virtue. With theſe ſenſible qualities, it manifeſtly contains a large proportion of a ſubtile eſſential oil. Held to the light, it ſeems full of ſmall holes, and hence is called *Perforatus*. Theſe, however, are only cells, in which the ſubtile eſſential oil is lodged. Somewhat of the ſame kind appears around the ſides of the flower. All theſe are preſumptions of its utility, and there are many well-

* This is the moſt ſenſibly aſtringent of all this order.

vouched

vouched teſtimonies of its virtues, particularly of its diuretic powers. This virtue is ſaid to depend on its terebinthinate oil, but it alſo exerts the ſame (where much of that oil muſt be loſt) in dry powder, and in decoction, ſo that its diuretic quality ſeems to depend on its aſtringency. I have often intended to make trial of that ſubſtance, and if any perſon has a deſign of proſecuting the experiment, it is neceſſary he ſhould learn to extract the ſubtile eſſential oil, upon which, perhaps, its active virtues depend. Alcohol does this beſt. Neuman tells us, that the firſt affuſion of that gave him a pure red tincture, but that a ſecond gave a green, leſs impregnated one. Hence, then, I would recommend extraction by one affuſion of Alcohol, bringing that to proper ſtrength, by applying it to freſh parcels of the plant. As after this combination the Alcohol riſes with leſs heat than the oil, we may obtain our impregnation much ſtronger by evaporation.

This oil is much recommended in Epileptic and Maniac caſes, where, I confeſs, I do not underſtand how it can act, though, indeed, there are teſtimonies of its virtues.

LYTHRUM.

This was formerly known under the name of *Lyſimachia*, but now it is properly referred to different genera, as *Epilobium*, &c. They are all of the ſame natural order. *Lythrum* is applied to the genus of *Lyſimachia* by Linnæus.

I inſert it here from De Haen's authority, who ſays it was communicated to him by an Army Phyſician, and that he, in conjunction with Van Swieten, had experienced its good effects, in ten different caſes after Dyſentery. After exhibiting a purge, he gave it in doſes of a drachm, night and morning, and ſays, that if the diſeaſe be recent, it will cure it in three days; he cured an old Dyſentery *(annoſa)* in three weeks, which had reſiſted every other remedy. We ſeldom employ Aſtringents in Dyſentery. It is commonly

monly ſaid they ought not to be uſed before the acrimony is evacuated. I explained it in another way, *viz.* that before the determination to the inteſtines was taken off by other remedies, Aſtringents ought not to be uſed. De Haen ſhould have told us the caſes and circumſtances of Dyſentery where *Lythrum* was proper. He ſays it ought not to be uſed where the inteſtines are full of ſordes, and in caſes of laxity. By this I underſtand nothing. If in recent caſes he talks of laxity, it is merely from theory. In his fourth part, however, he ſays, that the *Lythrum* is chiefly of uſe in old Dyſenteries; and here I think that this and other Aſtringents are extremely proper, and we are generally too late in their exhibition; ſtrong ones would be improper, but certainly ſuch as will bring on aſtriction by ſlow and mild degrees, ought to be uſed.

MILLEFOLIUM.

This is much uſed in Germany, where it is conſidered not only as an Aſtringent, but a Sedative and Antiſpaſmodic. It was ſtrongly recommended by Stahl, and thoſe of his ſchool; whoſe authority, however, I ſhould not much regard, (as they often give high commendations to very inſignificant remedies,) had not Hoffman alſo recommended it. It is a very doubtful plant to appearance. The herb ſeems to be a weak aſtringent with acrimony. The flowers are remarkably acrid, and contain a very acrid eſſential oil. It is doubtful (as the part of the plant employed is not ſpecified) whether it is antiſpaſmodic from its aſtringency, or eſſential oil. In this country I have ſeen the powder of the flowers uſed with ſucceſs in flatulent cholics; and from its *aroma*, it probably may be uſeful in hyſteric caſes; from all which, however, I muſt ſuſpect, that it ought to be thrown out of the liſt of Aſtringents, and put into that of Antiſpaſmodics.

MYRTUS, MYRTLE.

Both the leaves and berries have been uſed, and by their ſenſible qualities they are evidently aſtringent; but they are properly neglected

lected here, as neither being native, nor of ſuch peculiar virtues, as ſhould make us import them from foreign countries.

PLANTAGO, PLANTANE.

This plant has many virtues imputed to it, but from its ſenſible qualities, I imagined it of little efficacy, till I was informed by the late Dr. Clerk, that he had ſeen ſeveral Hæmorrhages yield to this, which had reſiſted ſeemingly more efficacious medicines. If ſuch effects are to be expected from it, it muſt be uſed in large doſes, and continued for a length of time. I have ſeen it uſed in Hæmorrhages and Hæmoptoes, but without any manifeſt effects; and any that appear, might probably be owing to the other remedies employed along with it, a low diet, and repeated bleedings. The Leaves and Seeds of this plant are in uſe. The Seeds are of little uſe, being a mild farinaceous ſubſtance, the Leaves are the principal part, and the Huſks have moſt aſtringency.

POLYGONATUM, SOLOMONS SEAL.

Here is an inſtance of the neceſſity of taking notice of the particular part of the plant to be uſed. The Flowers, Berries, and Leaves of *Polygonatum* are of a very acrid and poiſonous nature. The Root is the part only to be uſed. It is remarkably mucilaginous, with little acrimony, which is of the ſame nature with that of the flowers, *&c.* but may be diſſipated by boiling. By miſtake, the whole of this plant has been ſpoken of as an Aſtringent, but it ought to be confined to the Roots. The Root I have often known uſed with ſucceſs in Hæmorrhoidal Swellings, and Bleedings. The doſe is ʒß. boiled in milk from ℔j. to ℔ß. and continued every night; and in many inſtances have I ſeen it remove the pain and ſwelling. Several other remedies of the aſtringent kind have been employed with ſucceſs in Hæmorrhoids. Wherever theſe evacuations are critical, Aſtringents are improper, but they are not always ſo. They are often accidental, from hardened *fæces* preſſing upon, and cauſing a fullneſs of the neighbouring veſſels; and here, cer-

tainly, when we obviate the coſtiveneſs, the habitual determination to the part ſhould be taken off gradually, by the proper and mild uſe of Aſtringents. Some have alledged, that the Hæmorrhoids ſerve the ſame purpoſe in men, and are equally neceſſary and critical with the *menſtrua* of women. But I know that as many, nay many more women are affected with the Hæmorrhoids than men, and at the ſame time have their *menſes* regular, which ſhews that it is often a diſeaſe, and not always a critical determination. In this diſeaſe we ſhould employ only ſuch Aſtringents as act in the *primæ viæ*, and ſuch are the vegetable; for if we employ thoſe of a ſtronger kind, as Alum, *&c.* we ſhall at the ſame time be in hazard of having their action extended too far, and of ſuppreſſing *menſes*, and neceſſary evacuations.

SANICULA.

Materia Medica writers conſtantly conſider this as an Aſtringent, but it belongs to the *Umbellatæ*, a very acrid claſs, and many of them poiſonous; and, therefore, *à priori*, we are not to expect any Aſtringents from this claſs. I find it has ſome of their qualities, and that its aſtringency is very doubtful; and therefore I reject it as an aſtringent.

SEDUM.

In the eye of the Botaniſts this is an ambiguous term. It is the name of a genus comprehending a variety of ſpecies, of very different, nay, many of them of oppoſite qualities. What I mean here, is the *Sedum majus*, or *Sempervivum*. It is a vegetable of moderate aſtringency, and has been conſtantly conſidered as a cooler. As it has no ſenſible acidity, or ſaline poignancy, I can ſee no foundation of its cooling qualities. It has been recommended as a cure for corns. Some, for theſe, have ſought a remedy in acrid ſubſtances, but theſe are very improper. This, merely from its ſucculency, may be uſeful; for I know no cure for corns, but ſuch as will obviate the hardneſs in the neighbouring parts, and, by ſoftening, diſpoſe

diſpoſe the corn to ſeparation; and this intention the *Sedum* anſwers remarkably well, applied as a poultice.

VISCUS QUERNUS, MISLETOE.

Much ſuperſtition has been mixed with the uſe of this medicine; ſo much, that its real qualities have been ſuppoſed falſe. But in this I cannot agree. It has been particularly famous in the cure of Epilepſy. When Epilepſy proceeds from an increaſed mobility, allowing the ſpaſmodic affection to recur upon ſlight occaſional cauſes, Aſtringents are certainly uſeful, and in this caſe have I ſeen the Miſletoe uſed with ſucceſs. It has Bitterneſs joined with its Aſtringency; and Sir John Floyer ſays, that he has ſeen it in ſome inſtances cure Quartans, where the doſe was conſiderable, and continued for a length of time. This remedy gained great reputation in England, where ſeveral treatiſes have been written upon it; and Cartheuſer now gives his teſtimony in ſupport of its virtues. I make no doubt of the virtues, but not on Cartheuſer's authority, becauſe in the caſes where he uſed it, he employed ſeveral other remedies at the ſame time.

As to the choice of the plant, we now know that we need have no regard to the tree on which it grows; for it is preciſely the ſame as obtained from the Oak, Apple, Hazel, *&c.* This ſhows that plants do not differ ſo much from the juices they take in, as from their different aſſimilatory organs. The whole of the plant has been employed, but the virtue reſides in the Bark, which may be uſed in the doſe of ʒß. or ʒj. and if continued for ſome time, it will be found an efficacious Aſtringent, eſpecially where a ſlight Bitter is at the ſame time required. It is beſt employed in ſubſtance, for it does not give out its virtues in ſolution.

URTICA, NETTLE.

The ſenſible qualities of the Nettle are not equal to the virtues attributed to it. Whatever be in this, the teſtimonies in its favour

are very ſtrong, and I have them confirmed by experience. The great uſe of it by ſome, in diet, ſhows it is not a medicine of great activity. Its recent juice ſhould be employed, or a ſtrong decoction of a handful of it, *i. e.* the herb, and thus have I ſeen it have immediately effect, in taking off the ſwelling of the Piles.

It has been much ſpoken of for diuretic virtues, as well as other aſtringent plants. This is very difficult to explain, though it would ſeem they undoubtedly poſſeſs it.

UVA URSI.

This is a title which has ſeldom appeared in the *Materia Medica*, and never in any officinal liſt. *Uva Urſi* is not the proper botanical appellation. From the Practitioners at Vienna, we have accounts of very extraordinary virtues imputed to this plant. If theſe turn out to be true, it will ſhew us that very curious virtues may be lodged in unſuſpected ſubſtances. I cannot ſay what has led them to make uſe of it. It has been recommended by ſome as an Aſtringent. The Phyſicians of Montpelier have hinted in general, that it is good in calculous caſes. Van Swieten recommended it to De Haen, who tells us, that it has been found a certain cure in all caſes of purulency, and alſo in any ulcers of the urinary paſſages; ſecondly, in calculous caſes, it enables them to retain their urine, and obviates the ſtrangurious pains. It alſo changed the appearance of the urine. In ſome of theſe caſes, where it was bloody, alkaline, and purulent, nay ſo ſtrongly alkaline as to effervеſce with acids, it brought the urine back to its natural appearance, and made it depoſite a healthy ſediment. In ſome caſes, indeed, he ſays, it failed, but theſe were ſuch, that in them the urinary paſſages were in ſuch morbid ſtate, that it was paſt the power of Nature to have effected a cure, or even Lithotomy itſelf to have relieved. Where all the ſymptoms attending the ſtone ſeem to be removed, we are very apt to ſuſpect the ſtone itſelf is diſſolved, but here there was no ſuch appearance, and the catheter

catheter always found the ſtone of the ſame ſize and roughneſs as before. The plant was always uſed in ſubſtance. At firſt, De Haen's doſe was ʒß. of it powdered, once a day; but he now tells us, in his laſt volume, that he uſes the ſame quantity three times a day. He makes no obſervation on the operation of the medicine, whether it bound the belly, palled the ſtomach, *&c.* neither does he mention the remedies which accompanied it. He only ſays, that opiates in the beginning were given, to eaſe the pain, and that only injections were thrown in; but that ſoon both theſe were ſuperſeded as unneceſſary. To leave without doubt the efficacy of this remedy, De Haen tells us, that, as it required a length of time, many, when their ſymptoms were a little alleviated, tired with the diſagreeable doſe, laid it aſide, but that ſoon the ſame ſymptoms recurred, which were again relieved by returning to this remedy, and that this renewal of the ſymptoms from laying aſide of the remedy, and relief of them from reaſſuming it, happened to the ſame perſons five or ſix times. Taking all theſe circumſtances together, with the authority of two ſuch remarkable perſons, acting under the eye of ſo many people, I think we can hardly doubt of the facts. From ſome difficulties in theory, and inſtances where ſuch like teſtimonies have failed, ſome doubts may ariſe; but certainly theſe ſhould not prevent our making a trial of the medicine.

De Haen has attempted the rationale of this medicine's action, but after many attempts, has at laſt given it up, as uncertain. Till we have an opportunity of making the experiment, it is worth while to attempt the rationale. It may be obſerved, and De Haen aſſiſts me in the obſervation, that in the Annals of Phyſic there have been many inſtances where calculi have been carried in the kidneys and bladder without inconvenience. This is difficult to account for. Some may think the ſmoothneſs of the ſtone to have been the reaſon; but it is found, and I have ſeen ſtones as ſmooth as poliſhed marble, give great uneaſineſs; while, on the other

other hand, rough ones gave none; and even this would not obviate the inconveniences, from the weight of the ſtone. Inſtances have been given of lime-water relieving the ſymptoms of the ſtone; while at the ſame time, the catheter ſhewed the ſtone ſtill remained in the bladder. Dr. Whitt thinks the lime-water acts by diſſolving the ſtone into a mucous ſtate, *i. e.* its ſurface, and ſo taking off the aſperity. Theſe, I imagine, will not anſwer entirely, and in the *Uva Urſi*, the ſtones have been found equally rough as before; though the ſymptoms have been relieved; and beſides, if the lime-water acted in the way alledged, the diſſolved mucus muſt be carried away by the urine, and if the lime-water continued to act in the ſame manner, the whole ſtone would be diſſolved, which, in ſtones of any conſiderable largeneſs, has not been found to be the caſe. We muſt, therefore, endeavour to find ſome other explanation.

The ſymptoms of the ſtone do not ſo much depend on the ſize or ſurface of the ſtone, as on the acrimony of the urine, which conſtantly accompanies the ſtone. This is certainly the caſe in the *Uva Urſi*, it removing the bad ſtate of the urine, with little effect upon the ſtone, which, except the ſymptoms of the ſtone depended on the acrimony of the urine, would be inconceivable. In ſtones of the kidneys, the conſequent ſtrangury has been ſuppoſed to proceed from conſent of the urinary paſſages, but much more probably does it ariſe from acrimony of the urine. Here let me throw in an obſervation, by the bye. It has been ſuppoſed a ſpecious proof of the efficacy of Lime-water, that out of the body it diſſolves ſtones; but in theſe caſes the very alkaline urine muſt be ſuppoſed to do the ſame. In changing the urine, I imagine the *Uva Urſi* may act in changing the ſtate of the ſecretory organ, inducing a ſtricture and ſtrength of the part; ſo that you ſee there might be ſome foundation for the ſo often repeated nephritic and lithontriptic virtue of Aſtringents, by *Materia Medica* writers. The laſt I thought impoſſible to reſide in any vegetable, but now you ſee there may have been

been a foundation for ſuppoſing it, as the ſymptoms of the ſtone were relieved. As Lime-water and Cauſtic Alkali out of the body diſſolve ſtones, ſo they relieve its ſymptoms in the ſame manner. If it comes out that the *Uva Urſi* has the effects alledged, we muſt certainly then think, that the Lime-water acts more as an Aſtringent than a Solvent; for there are many objections with regard to the ſolution.

The *Uva Urſi* is not a native of Great-Britain *, and in the Southern countries is only found on the higheſt Alps, where the ſnow continues the whole year; ſo that we ſhould, if the facts be confirmed, endeavour to find a ſubſtitute for it; for if it be imported, it will certainly be adulterated. I imagine ſome other of the Aſtringents, formerly mentioned, might anſwer; but I had rather chuſe to proceed on the Botanical analogy, and take a plant of the ſame genus, and as near a-kin to it in habit as poſſible. This plant is a ſpecies of the *Arbutus* of Linnæus; what is moſt a-kin to this genus, is the genus of *Vaccinium*. The *Arbutus* is a genus not very conſiſtently made up, and it is ſtill a diſpute among Botaniſts, whether ſeveral ſhould not be taken from the *Vaccinium* and put into this. There is in Britain only one ſpecies of the *Arbutus*, found in the Iſle of Mull, by Floyd, but this is ſo rare, that we muſt have recourſe to a ſpecies of the *Vaccinium*; and certain it is, that there are ſeveral plants in the *Arbutus*, which were formerly in the *Vaccinium*. The plant I would chuſe as a ſubſtitute for the *Uva Urſi* is the *Vitis Idæa ſemper virens foliis, &c.* It occupies high grounds, and is to be found not unfrequently in the Highlands. I have already got a ſpecimen of it; and ſhall endeavour to procure more, and make proper experiments. The next liſt in the Catalogue contains

* It has ſince been found in great plenty in the Highlands of Scotland, by the late Dr. Millar; ſo that there is no occaſion to have recourſe to the ſubſtitute here propoſed.

The

The INSPISSATED JUICES.

Acacia and *Hypociſtis* are almoſt now unknown; by the accounts we have of them, and by what I have ſeen of them, they ſeem to be ſimple and pure Aſtringents, but without any peculiar property which ſhould give them the preference to any Aſtringents in preſent practice.

CATECHU, JAPAN EARTH.

The name *Terra Japonica* is very improper, for *Catechu* is a vegetable inſpiſſitated juice, and that which is moſt frequently employed. It is a tolerable powerful Aſtringent, and I have often experienced its effects in Diarrhœas and Dyſenteries. I never uſed it in *Fluor albus*, profuſion of the *Menſes*, *&c.* ſo that I do not know whether its effects are propagated over the ſyſtem. Its virtues are equally extracted by water and ſpirit, and it has no diſagreeable ſmell or taſte; ſo that the uſe of it is very proper. Though a ſubſtance of no great value, we never get it pure, but adulterated with earths, *&c.* which may be diſcovered by elutriation, and more effectually by ſolution. All this would lead us to endeavour to find for it a ſubſtitute of our own growth.

SANGUIS DRACONIS, DRAGONS BLOOD.

This is ſtill employed, but is no Aſtringent. It is a pure reſinous body, inſoluble in aqueous *menſtrua*, and probably in our *primæ viæ*. It was probably introduced firſt by its ſignature, as all red plants were employed to ſtop hæmorrhages. It may be conveniently employed for forming Alum into pills, being melted with the Alum. For this purpoſe it ſhould not be powdered, and only enters as a fourth of the whole. Our next liſt is

The BARKS.

Cortex Granatorum & Querci are ſubſtances extremely aſtringent, with very little of any ſenſible Bitterneſs. Their Aſtringency

is

is confirmed by their uſe in tanning, ſo that I believe them efficacious as any Aſtringents externally applied. They have the conveniency of being ſoluble in water, but then they afford but a weak impregnation, and long boiling deſtroys their aſtringent quality.

CORTEX FRAXINI.

This has a Bitterneſs conjoined with its Aſtringency, reſembling the Peruvian Bark, for which, both it and the *Hippocaſtaneus*, which ought to have been ſet down, have been employed as ſubſtitutes; and, as I have ſeen, with ſucceſs. We have here Sir John Floyer's teſtimony of their being uſeful in Fevers, where they acted by promoting ſweat.

The ſeeds of the Aſh, too, have been employed in medicine, which have likewiſe a kind of Bitterneſs, joined with their Aſtringency, called by Haller aromatic Acrimony; and may be a medicine of conſiderable efficacy. Both the Bark and Seed have been recommended as nephritic and lithontriptic. Glauber ſeems very confident in recommending them; and Dr. Bold adds his teſtimony to the ſame virtues. If I have an opportunity, I ſhall endeavour to make trial of them as a ſubſtitute for the *Uva Urſi*.

CORTEX SIMAROUBÆ.

This is an inſtance of the fate of medicines, which, in ſpite of being recommended with confidence, and teſtimonies given of their ſucceſs, often remained without a fair trial. The fault is commonly in calling them ſpecific; ſo that when they are not found to anſwer in all caſes, they are thought to be uſeful in none. From its ſenſible qualities, it is not aſtringent, and from the French writers, it does not appear to be ſo. Generally in large doſes it vomited and purged, and in ſmall, was without any ſenſible operation. It has been recommended in Dyſenteries, but I refer you to the French writers. Next follow

WOODS.

Of theſe I have only mentioned one, though ſeveral others are common. All of them contain ſomewhat of Aſtringency, but have other qualities joined, which render them unfit for this intention.

LIGNUM CAMPECHENSE, LOGWOOD.

Logwood, like other vegetable Aſtringents, is very difficult of ſolution. It diſcovers its aſtringency, by ſomewhat of an auſtere ſtyptic taſte, more manifeſtly by its making an ink. Both from the ſenſible qualities, and its making but a weak ink, I conceive it to be but a very weak aſtringent, and alſo from its being uſed only in decoction. We endeavour to obviate this by bringing it into an extract, but the proceſs is difficult, and ſeldom well executed, and the long boiling commonly deſtroys the aſtringency, as much as we endeavour to encreaſe it by concentration. Some, however, think its weakneſs recommends it; but on repeated trial I have never found it of any efficacy.

GALLÆ, GALLS.

This is an excreſcence ariſing on trees, from the puncture of inſects. In practice we confine ourſelves to the excreſcence of the oak, and commonly get it from foreign countries. However, all the Galls have a ſtyptic quality, and I think the term ought to be made general, and we ſhould employ any excreſcence of any tree produced in the ſame manner. That Galls are a powerful Aſtringent, appears from their being univerſally preferred in making of ink, and very much in tanning. Galls are remarkable for giving out their Aſtringency more copiouſly in ſolution than any other vegetable Aſtringent, and therefore for external uſe, as in fomentation, *&c.* I have always uſed them preferably to any other. They are certainly good Aſtringents, and nothing but the doubts which I gave in general of the propriety of the uſe of vegetable Aſtringents hinder their internal exhibition. They have uſed them in Intermittent

mittent Fevers, as you may ſee in the Memoirs of the French Academy; and as they are purely aſtringent, it gives a doubt whether Peruvian Bark acts from its Aſtringency, or other qualities.

Having finiſhed particular Aſtringents, I have ſet down in my liſt, terms more or leſs general, in Italic character, comprehending medicines more or leſs ſuited to our intention.

1. ACIDS as ASTRINGENTS.

Theſe were formerly mentioned in the *Nutrientia*, at *a*, in my liſt, and will afterwards be ſo more particularly in my eleventh head, the *Antalkalina*, at 1, and 2. I ſhall only juſt now ſay ſomewhat on them as aſtringent.

That all Acids are Aſtringents is pretty manifeſt. Applied to the ſkin they produce contraction and corrugation. Nothing is more common than for the weakeſt Acids ſo much to contract the lips, as to take away their colour, hindering them to receive ſo much red blood as they received in their natural ſtate. With regard to the Aſtringency of Acids, it may be a queſtion whether it is naturally connected with particular Acids, or whether it is common to all, and only differs from the different concentration. Thus ſome have imagined that the vitriolic and perhaps the muriatic Acid are ſtronger than the nitrous or vegetable. Whatever is in this, to me there is certainly a difference between the foſſile and vegetable Acids. The vegetable Acid, in oppoſition to the foſſile, is capable of being changed in the *primæ viæ* by fermentation, and of having its acid nature deſtroyed before they enter the blood. Again, the foſſile Acid ſtimulates the excretories; and if this effect is to be expected from the vegetable, they muſt be given proportionably in greater quantity. I ſhall go farther with this obſervation, and ſay, that of the vegetable Acid even a difference is to be made. The native Acid is more liable to undergo changes than the fermented, having both the vinous and acetous fermentations to go through, which are paſt in the fermented Acid. Hence a queſtion ariſes, whether the acid

fruits be recommended properly in the Dyſentery? To me, indeed, in ſuch caſes, vinegar would ſeem preferable, unleſs the native Acid had ſo much acerbity with it, as to have the power of checking the putrefactive fermentation. Hence I imagine there is ſome propriety in the practice of the German ſoldiers in the Dyſentery, of taking vinegar and cream. As Aſtringents in the *primæ viæ*, the fermented Acid may be proper, but wherever we want to have the effect of the Acid extended farther, as in Hæmorrhages, there we ſhould prefer the foſſile Acids. Theſe have not only the power of producing contraction, but alſo diminiſh the mobility, acting as ſedatives. With regard to the uſe of Aſtringents in Hæmorrhages, it has been objected to its propriety, as their Aſtringency may often encreaſe the impetus of the blood. Now the foſſile Acids obviate this objection, for they not only conſtringe, but alſo take off the encreaſed impetus of the blood, both as acting like ſedatives, by diminiſhing their moving power, and on the fluids, as far as they enter into them, by allaying their inteſtine motion.

2. AUSTERE WINES, as ASTRINGENTS.

Theſe act as acerb, but are liable to the ſame objections as the native Acid. They have, indeed, gone through the vinous fermentation, but that generally imperfectly, and have ſtill the acetous to undergo. By this means they may be troubleſome in the *primæ viæ*, and may there be changed before they enter into the blood. Burnt wines are properly employed as Aſtringents, becauſe by this means their auſterity is encreaſed, and they are rendered leſs liable to ferment. Upon the whole, aſtringent wines are of little efficacy, and auſtere wines are only to be preferred where a choice of *wine* is neceſſary. In the choice of wines, often more nicety than judgment is ſhown; and the colour, which is often artificial, directs more than the qualities. Red wines, however, are commonly preferable as acid and auſtere. All the others, except the Moſelle and Rheniſh, are of a ſtronger body, more ſtimulant and heating, with leſs of the Aſtringency.

3. BIT-

3. BITTERS as ASTRINGENTS.

Bitterneſs is often conjoined with Aſtringency, and it is doubtful whether Bitters themſelves are not aſtringent. When combined together they have been univerſally conſidered as Tonics and Roborants. Whether this be owing to their Aſtringency, or Bitterneſs, ſhall be afterwards conſidered.

4. SEDATIVES as ASTRINGENTS.

Theſe are more indirectly ſo than any of the former. I told you, that a chief uſe of Aſtringents was in checking evacuations. Now this may be done either by the Aſtringents, as contracting the veſſels, or by the Sedatives, as diminiſhing the impetus of the fluids.

5. BALSAMICS as ASTRINGENTS.

Theſe are enumerated under my fourth claſs of medicines at *f*. They are ſet down here, becauſe they are frequently preſcribed in preternatural and encreaſed ſecretions of the urinary paſſages, in gleets, gonorrhœas, *&c.* In the *primæ viæ*, however, their effects ſeem oppoſite to aſtriction, and under the head of Stimulants, you will ſee them conſidered as laxatives, and, indeed, they often make excellent ones; ſo that, on the whole, they are improperly conſidered as Aſtringents. I allow, indeed, that they will act in ſtopping a gleet; but that, I imagine, is from exciting an inflammation in the urinary paſſages, to which they have a natural tendency, and a proof of this may be alledged, that *Cantharides* are employed in the ſame intention.

EXSICCANTS as confounded with ASTRINGENTS.

Materia Medica writers commonly claſs theſe as Aſtringents. Every dry powder may be employed for this purpoſe, but none of them have their effect internally. There is one indication of Exſiccants which occurs in practice, *viz.* in abſorbing moiſture on the

the ſurface of the body, as *e. g.* in caſes of diſagreeable and troubleſome ſweats, *&c.* Aſtringents here would be dangerouſly employed, as checking, perhaps, critical evacuation, of which exſiccant powders will take off the diſagreeableneſs, without oppreſſing the diſcharge. In Eryſipelas, and affection of the *rete mucoſum*, theſe powders do not act as repellents or aſtringent, but by abſorbing an acrid *mucus*, which is often apt to exſude and taint the neighbouring parts. Powders of boles and chalks have been employed; but theſe make a hard cruſt with the *mucus*, and mealy powders have a better effect, which never ſhould be too fine, and thus oatmeal anſwers better than flour, as it abſorbs the *mucus* better, and is not ſo apt to harden. Theſe I have frequently ſeen anſwer, after ſpirituous and oily medicines, and *Saccharum ſaturni*, *&c.* had been applied, without effect, in allaying and diſcuſſing the inflammation. If the meal be fixed in the cloth applied, it anſwers ſo much the better, and hence the proper practice of the poor people, in uſing, as an application, the inſide of the meal ſack.

Aſtringents being now finiſhed, we ſhall next proceed to our third general head, *viz.* Emollients.

EMOLLIENTIA.

Theſe are ſuch medicines as diminiſh the coheſion of the ſimple ſolids, in oppoſition to Aſtringents. The operation of Aſtringents is difficult to explain, and is ſtill doubtful, that of Emollients is hardly ſo. Whether we conſider the ſimple ſolids as compoſed of earth, interſperſed with gluten, or take them as a mixt, they may be ſoftened by the interpoſition of fluid parts, or by thinning the gluten. Poſſibly the term laxative would be more proper than emollient, but we are obliged to retain the latter, as the former would be apt to be confounded with eccoprotics. Emollients are applied with a double intention, not only to diminiſh the coheſion, but to ſoften; and may act, either by diſſolving the gluten, or by introducing a larger proportion of fluid parts into the compoſition of the fibre. Perhaps their action ought not to be entirely confined

to

to this. Around every ſolid fibre there is a proportion of cellular membrane; nay, ſome have ſuppoſed, that the whole ſolids of the body are only condenſed cellular membrane. Hence, then, Emollients, without entering into the compoſition of the ſolid fibre, may act upon them, and produce relaxation, by more fluids being interpoſed in the cellular texture.

We can hardly ſay, that Emollients act upon the moving fibres. They can only do ſo, in ſo far as tenſion and firmneſs of the ſimple fibres is connected with the oſcillatory power of the *ſolida viva*. It is not the ſame with the Emollients as with the Aſtringents; for theſe laſt always extend their action, and have ſomewhat of a ſtimulating power. If the Emollients propagate their action, it is only in ſo far as they alter the equilibrium, *i. e.* in cauſing an increaſed flow of fluid to the part relaxed. Hence they have been ſuppoſed Derivatives, but they are very ſeldom uſed *ſimply* in this intention. Thus we ſeldom uſe plain oil, *e. g.* as a Derivative, but commonly aſſiſt our Emollients with warmth, which here acts as a ſtimulant, and determines a greater flow of humours to the part. The operation of Emollients occurs only externally; for we can have but little conception of internal Emollients: We cannot ſuppoſe them given in any quantity, ſufficient to be introduced in ſuch proportion, to every ſolid fibre, as to bring on an univerſal relaxation. Indeed, by ſimple water, we may diminiſh the denſity of the blood, and bring on laxity, and debility of the ſyſtem; but that this is purely by applying an Emollient to the ſimple ſolids, is hardly conceivable. Emollients may have ſome effect in the *primæ viæ*, and relax the ſtomach and inteſtines; but even there, I am perſuaded, their operation is perfectly different from ſimple relaxation; for the inteſtines are lined with a mucus, which will hinder their immediate application to the ſolid fibres. The effect of warm water on the ſtomach is a very difficult problem. After reflection, I have not thought of any thing more ſatisfactory than this, *viz.* that Nature has given us an inclination for cold, and an averſion for warm water, which, though a moſt mild

ſubſtance,

ſubſtance, is often rejected in vomiting, &c. This is all that can be ſaid with regard to the operation of Emollients; we now proceed to

INDICATIONS of EMOLLIENTS.

1. They are indicated in every caſe of too much dryneſs of the ſimple ſolids. Here they can only be applied externally, where there are fiſſures, chaps, and indurations of the ſurface. 2. Emollients are indicated in all caſes of rigidity, whether it exiſt in the ſimple ſolids, or in the moving fibres. Where the firſt are within our reach, the effects of Emollients are evident; with regard to the moving fibres, Emollients may act in ſo far as they fill the cellular texture with water, oil, or mucilage; thus taking off the tenſion of the ſolid fibres, and ſo diminiſhing the oſcillation of the moving. 3. Independent of a morbid rigidity, Emollients are indicated in caſes of inflammation. 4. Emollients are indicated, wherever we want to induce a greater laxity, for the ſake of derivation or revulſion. I will not determine here, whether they operate in this caſe by the heat commonly joined with them, or by their moiſture; or whether the relaxation is confined to a particular part, or extended over the ſyſtem. Certain it is, that tenſion is neceſſary to the ſyſtem, and that this tenſion depends on the tenſion of the neighbouring parts, and ſo of the whole ſyſtem; and it is to be imputed to this, that relaxants, applied to a particular part, will ſometimes induce a relaxation of the whole body.

It is not, however, probable, that they go commonly to this degree. In all theſe caſes, Emollients are externally applied. Internally, by theſe we cannot conceive any conſiderable relaxation induced on particular parts, which muſt only be effected by a general relaxation of the ſyſtem, which muſt be very ſlow and gradual. They may act, indeed, internally, not as Emollients, but as Demulcents, covering acrimony, which, as Emollients, they would only dilute.

PART

PARTS of EMOLLIENTS in which their VIRTUES reſide.

Wherever any ſubſtances act as Emollients, it is in conſequence of the water, oil, or mucilage they contain; which, wherever they occur without acrimony, are emollient; and wherever that virtue takes place, it is in conſequence of one or more of theſe. Water, as penetrating more immediately, is, perhaps, moſt conſiderable in producing relaxation; but then it has the diſadvantage of being ſoon diſſipated, of taking off with it part of the animal gluten, and of leaving the ſolids more friable than before. If oil could be as eaſily introduced, its effects would be much more durable, without the inconvenſency of water. The extremities of the apertures of the veſſels on the ſurface are extremely apt to be affected with any thing blocking them up. In warm countries, where *ſordes* are very apt to adhere to the ſkin, warm bath is uſed to clean them off. At the ſame time unction is uſed to obviate the criſpature, to which the ſkin would be liable, to prevent its chapping, &c. Mucilages, compoſed of oil and water, are of a mixed nature, more approaching to water, perhaps, in its penetration, and certainly in its leaving the part more dry and friable. With regard to the uſe of oil, it is ſuppoſed an improper Emollient, as from its tenacity it may ſtop perſpiration, on which account it has been thought that it ought to be rejected in Surgery. All of this theory ſeems to be unſound. If ſuch was its property in warm countries, where perſpiration is ſo neceſſary, it would not be much uſed. I imagine, that, unleſs where it is ſo thick as to dry on the ſkin, and entangle the duſt in the air, and the *ſordes* of the ſkin, it can hardly affect perſpiration. Hence, then, the practice of the warm countries ſhould always be taken together, unction and warm bathing. Perſpiration flows with ſome force from the ſkin, as any one may obſerve, who will take the trouble to render it viſible. This velocity is ſo great, that it would ſeem to be capable of overcoming the reſiſtance of any ſuch fluid as oil. Nay, I have ſuppoſed that oil may excite perſpiration, by relaxing the orifices of the veſſels, at leaſt ſome of its effects ſeem to ſay ſo.

I cannot account for this phænomenon otherwiſe, *e. g.* in a *Coryza*, where the inner membrane of the noſe is ſo ſwelled and tumified, as hardly to allow of breathing, which complaint is ſo frequent in children, as often to prevent their ſucking. I have ſeen relief given by oil or butter. In the *Angina*, it was formerly the practice to employ a bland oil externally, but camphorated oil, with cauſtic alkali, are now commonly employed. The common people ſtill uſe butter, or oil, which gives a conſiderable relaxation to the internal ſwelling, by producing a relaxation externally, and promoting the perſpiration of the part. It may, indeed, act, in ſome meaſure, by changing the equilibrium; but it is very plain that it muſt, chiefly, in the manner obſerved.

3. *Senſible qualities which diſcover Emollients.* A bland, mucilaginous, or oily taſte, without acrimony.

4. PHARMACEUTICAL TREATMENT.

Emollients are always extracted by water, in oppoſition to ſpirituous *menſtrua*, whoſe effects are oppoſite to relaxation. In ſome caſes they may be extracted by oil, where an oily matter is to be obtained; but I would alledge, that vegetable matters, which contain much oil, will not give it out to oil, and that it would be much better obtained by expreſſion.

PARTICULAR EMOLLIENTS.

With regard to theſe, they are ranged under three heads, of Water, Mucilage, and Oil.

1. AQUA, et AQUOSA BLANDA.

With regard to the emollient virtue of theſe, we have already ſpoken; and of their other virtues ſhall ſpeak afterwards. In practice, Water is what they chiefly derive their effect from; we indeed endeavour to impregnate this, but, while the Water is in con-

conſiderable proportion, this impregnation adds or diminiſhes little from its virtue. We muſt not, however, neglect to talk of the vegetables which have been employed.

COLUMNIFERÆ.

Vide Catal. letter *a*.

This is a *natural* order, as much ſo as any, and comprehends a great many *genera* and *ſpecies*. I have only ſet down two of the *genera*, which enter our Diſpenſatory Liſt, though I make no doubt but all the others might be equally employed, in deficiency of theſe; for, as far as they are expoſed to our examination, they all agree in being bland and mucilaginous. The moſt powerful we know, are the roots of *Althæa*, which afford a mucilage of very great uſe as a Demulcent. Externally it may be of ſome uſe as an Emollient, but as it is commonly ſo much diluted with water, the emollient effects of it are chiefly to be imputed to that.

Both for an Emollient and Demulcent, the root ſhould not be employed as recently dug up, nor, at the ſame time, too much dried. In the one caſe it is too much diluted with water, in the other the mucilage is not eaſily extracted, ſo that an intermediate ſtate, between both theſe, is to be choſen, which, I imagine, is ſeldom the caſe in our ſhops. *Althæa* root might be prepared in the ſame manner as Salep, and, in a powder of that kind, it would yield its mucilage much more eaſily.

The *Malva* has nearly the ſame qualities, but inferior in degree.

FARINOSA.

The chief of theſe have been enumerated under the *Nutrientia*. I have added here ſome not ſo commonly known. With regard to theſe, they are fit for Emollients, as containing much oil. I mentioned their difference with regard to their oil under the *Nutrientia*. Hence you will ſee, how the *Farina* of the *Legumina* is an Emollient, preferable to

that of the *Cerealia*. Sometimes theſe meals are employed in poultices externally. Thoſe made of the *Cerealia* ſoon dry, while thoſe of the *Legumina* are more oily, and retain their moiſture much longer. They have been employed as favourite applications to the eyes. For this purpoſe bean-meal is better than oat-meal, and that again than wheat-meal, as attracting more moiſture, and not being ſo apt to harden. Thus much ſaid with regard to *Farinoſa* in general, I proceed to the particular ſubſtances ſet down in the Catalogue.

SEMEN CANNABIS, HEMP-SEED.

In ſome countries this is employed as food. It is here doubted whether it ought to be applied externally, as medicine. The plant is very acrid, the ſeeds, contrary to the opinion of ſome, farinaceous and mild. A Phyſician here, fond of refinements, uſed to employ it as food to his patients, and I have never ſeen it, in valetudinarians, even in conſiderable quantity, produce any bad effect. With regard to its uſe as an Emollient, it is an oily ſeed, affording its oil by expreſſion; but not in any ſuch quantity as the *Semen Lini*, and therefore may be diſregarded.

SEMEN CYDONIORUM, QUINCE SEED.

It approaches the *Cerealia*, and might be uſed in the ſame manner, as a food. It affords a mucilage without ſeparation of oil, which is very eaſily extracted, on the account of its being diffuſible in water; which has made me lament our not having it in this country. It is remarkable of Salep, that a ſmall quantity of it thickens much water, but the Quince-ſeed has this effect more remarkably. Infuſed in water it does not ſit heavy on the ſtomach. They would not anſwer imported into this country, as they do not keep long without turning rancid.

SEMEN FÆNUGRÆCI, FÆNUGREEK SEED.

This contains an oily mucilage, conjoined with an acrimony and diſagreeable rank odour, which has confined its internal uſe to the farriers

farriers practice. It is a firm compact ſubſtance, difficultly extracted. It may be good in poultices, but then muſt be accurately powdered, and if kept in this ſtate, is very apt to be adulterated, as we find in the *Farina Fænugræci* of the farriers. All the foregoing I neglect for the following, *viz.*

SEMEN LINI, LINT SEED;

which has every advantage of mucilage and oil in its ſeed, and both externally and internally anſwers every purpoſe of the reſt. From its large proportion of oil it is diſagreeable to ſome ſtomachs, and cannot be introduced in ſufficient quantity. Hence, in theſe caſes, as a ſubſtitute for it, the frequent and proper uſe of the *Althæa* root.

SEMEN PSYLLII, FLEAWORT.

This is the ſeed of an acrid plant, which contains ſome mucilage, with ſomewhat of the ſame acrimony; which renders it nauſeous and diſagreeable. For theſe reaſons, and as a foreign plant, it may very properly be neglected.

So much with regard to the particular *Farinoſa* as Emollients. Many more of this claſs might have been mentioned; but I doubt, whether even thoſe ſet down are properly employed. In ſhort, any mild plant, with much water, might have been added to the liſt; but except they contain much oil, or mucilage, they may be neglected as Emollients.

OLERACEÆ.

Phyſicians, ſenſible of the neceſſity of oil, or mucilage, for conſtituting an emollient virtue, have explained the effects of theſe as Emollients, from a ſaline nitrous quality. With regard to any ſaline quality ſoftening our fibres, I take it to be impoſſible; allowing it were, the neutral, in the ſmall quantity contained in theſe plants, could not have this effect, and if a large one were uſed, its ſtimulus would counteract the intention; and therefore, from any

ſuppoſed

ſuppoſed nitrous quality, the effects of the *Oleraceæ*, or miſcellaneous liſt, are purely imaginary. One caſe, given in proof of this manner of action, is a deception, *viz.* their uſe in emollient clyſters, which are commonly mere Emollients, combined with a moderate ſtimulus, which theſe naturally afford from the ſalt they contain.

ATRIPLEX, BETA, ARRACHE, BEET.

Theſe contain no active qualities; ſo that nothing particular can be ſaid upon them.

BONUS HENRICUS, ENGLISH MERCURY,

I mention, as an inſtance of the neceſſity of acquiring the various ſynonyma in Botany. The botanical name has been applied equally to this and French Mercury, which is an acrid plant, and is commonly miſtaken for the *Bonus Henricus*, which is mild, and kept for it in the ſhops. Perhaps the miſtake has been uſeful, as it may ſucceed better in clyſters; but as an Emollient, its effects are very wide of the *Bonus Henricus*.

MISCELLANEOUS LIST.

Vide Catal. letter *d*.

ALSINE, CHICKWEED.

This is a mild, inſipid plant, ranked ſometimes as Aſtringent, ſometimes as Emollient, but in either intention its virtues are inconſiderable.

BRANCA URSINA.

This is ſomewhat mucilaginous, but inconſiderably ſo.

MELILOTUS, MELILOT.

This commonly ſtands as an Emollient, but its acrimony prevents this virtue. It belongs to the mild claſs of the *Legumina*, which are employed as food to domeſtic animals; but is much more acrid than any of its claſs. It was formerly introduced into our plaiſters, but even here, I have ſeen bad effects, from its acrimony. Hence, and for its being ſo apt to be adulterated with *Borago*, it is very properly rejected.

PA-

PARIETARIA, PELLITORY.

There is no foundation for the emollient quality of the *Parietaria*. If any, it is on the ſame footing as the *Olerateæ*, from its having ſomewhat of a nitrous quality. It has, too, ſomewhat of Aſtringency. It may be ſafely, but ineffectually employed. Any inconſiderable pectoral and diuretic virtue it has, muſt be owing to other qualities than that of emollient.

SAPONARIA, SOPEWORT.

This has probably entered into the liſt of Emollients, from the ſoapy ſmoothneſs of its leaves; but its juice has no pretenſion to ſuch quality, being rather acrid. Hence it has been recommended as aperient and diuretic.

VERBASCUM, MULLEIN.

This, too, ſeems to have been reckoned emollient, from the ſoftneſs and ſmoothneſs of its leaves. It ſurprizes me to ſee it has been called emollient, and demulcent; for it has no ſenſible mucilage, belongs to the acrid claſs of the *Luridæ*, and, when chewed, gives no taſte at firſt, but afterwards diſcovers a conſiderable latent acrimony. In theſe heads, you ſee, I have often been obliged to deal in negative virtues. I however, thought it proper to mark ſome ſubſtances, in order to give you my reaſons for rejecting them.

RADIX LILIOR. ALB. & CEPÆ COCTÆ.

Both contain a gluey, mucilaginous matter, with ſome acrimony, which is diſſipated by boiling; ſo that they are extremely proper ingredients in all emollient poultices.

OLEA PRESSA BLANDA.

Vegetable oils, if equally bland, have all the ſame virtues; ſo that there is no making a diſtinction of them as ſome have done.

They

They may ſometimes be extracted by decoction; but more commonly by expreſſion.

EMOLLIENTIA EX ANIMALIBUS.

The ſame may be ſaid of theſe as of the former. Milk is ſet down firſt as containing oil, but it rather belongs to the watery liquors, and I imagine is emollient chiefly from the water it contains. All the others mentioned, are only different forms of mild and bland oils.

They are much of the ſame conſiſtence; and if equally bland, I cannot imagine they have different virtues, which are the ſame as thoſe of the vegetable oils; although, ſometimes, their conſiſtence may vary their uſe, and make them keep longer. The Axungia, or fat of the Viper, has been recommended as a peculiar remedy applied to the eyes, but any mild animal, and equally fluid fat, would anſwer the ſame purpoſe.

We have now finiſhed the conſideration of the Medicines, which act on the ſimple Solids. We ſhall next conſider thoſe, which act on the living Fibres. I ſhall here repeat an obſervation formerly made, *viz.* that the medicines which act on the ſimple ſolids do not deſerve all that notice they have commonly had in our ſyſtems. The obſervations indeed on the *Nutrientia* are unavoidable, but thoſe which alter the ſimple ſolids occaſionally, are of very little importance. I obſerved the Emollients were almoſt confined to external application, and even there, did not propagate their effects much beyond the part affected. The Aſtringents were of more conſiderable and more extenſive operation, but then their effects were not entirely confined to the ſimple ſolids, and if they were confined to medicines acting merely on the ſimple ſolids, we ſhould make but very inconſiderable and very ſlow changes. The Medicines, we are now to conſider, are of more extenſive operation; but as the operation is more extended, ſo the theories are more doubtful. The laws of the nervous power are little known, and the ex-

explanation of any operation, depending on it, muſt be involved in the ſame obſcurity.

STIMULANTIA.

Theſe are ſuch medicines as excite the action of the moving fibres in living animal bodies. On the dead body they have no operation. Whatever excites motion in an animal body, is a Stimulus; Medicines, which have this effect, are called Stimulants: Firſt, with regard to their

MANNER of OPERATION.

Here Stimulants, perhaps, may be conſidered as of two kinds; Firſt, Thoſe which are indirect, *i. e.* which act on the organs of ſenſe, by which means a perception is excited in the *Senſorium commune*, which, acting there, determines the nervous power to flow more copiouſly into the whole, or a particular part of the ſyſtem; Secondly, Thoſe which are direct, *i. e.* becauſe they are imagined to act directly on the moving fibres. The indirect are the moſt common and univerſal; inſomuch that it has been a queſtion, whether the direct action of Stimulants ever takes place, and whether it is not always in conſequence of impreſſions on the organs of ſenſe. But there is nothing more evident, than that Stimulants may excite motion in the moving fibres themſelves, independent of any connection with the *Senſorium commune*. Thus we may ſeparate a ſingle moving fibre from the body, where there cannot be any connection ſuppoſed with the *Senſorium commune*; and yet, while heat remains in it, it is capable of having a motion excited in it by Stimulants. Hence I would alledge, that when the living body is entire, that medicines may act directly on the moving fibres, becauſe, in many inſtances, no effects on the *Senſorium commune* are previouſly evident. The metaphyſical Phyſiologiſts have ſuppoſed the abſolute neceſſity of a ſentient principle preſent in every action; and if, ſometimes, there is a want of conſciouſneſs, they ſay that this is deſtroyed by repetition and habit; and, indeed, in

many inſtances, this ſeems to be the caſe. Thus the motions of our eyes are owing to ſenſations excited by the impreſſions of light; but cuſtom has ſo familiarized this, that motions come to be excited without our direction. But ſurely there is no habit of emetics or purgatives, and theſe do not produce their effects on the ſenſe till the evacuation is made; and if they are ſometimes attended with pain, this is not produced directly by the medicine, but by its effect, the ſpaſmodic contraction.

From theſe, and other conſiderations, we muſt admit of two kinds of Stimulants. With regard to their operation, in both caſes the theory is difficult. In caſes of ſenſation, ſome kind of mechanical impulſe is ſufficiently evident; but we can hardly ſuppoſe, that from this we muſt deduce its effects. The motions produced, are not to be ſo accounted for. The effects are not at all proportional to the force of impreſſion, *i. e.* the force of mechanical impulſe. Weak impreſſions often produce ſtrong ſenſation, and ſtrong impreſſions oftner extend no farther than the part to which they are applied. I own it is to be wiſhed, and the Phyſiologiſts are in the right to endeavour to account for motions, as near as may be, from mechanical operation. Thus it is common to obſerve, that ſharp pointed bodies ſtimulate, and juſtly, in ſome meaſure, ſuch effect may be attributed to the figure, and motions thus excited may properly enough be ſaid to be produced from mechanical ſtimulus. However, Stimulants are not alone ſharp or pointed bodies. Every thing impreſſed on the fibres, which ſtretches them out, whether it be blunt or not, proves a Stimulus, and cauſes contraction. From this effect of ſtretching, joined with that of points, have Phyſiologiſts laid down a rule, *viz.* that whatever approaches to produce a ſolution of continuity is a Stimulus. But it is extremely difficult to prove this; and our fibres may be put in motion by ſuch cauſes as will not act in this manner. However, let us grant this for the preſent, yet it will have little effect in accounting for *Stimuli*; and it is as difficult as to account for the tremor of the air producing ſound, or that of the rays

of

of light our ideas of light. Nay, it is thought by Phyſiologiſts, that we might have been ſo conſtituted, that what now produces odour might have produced light, *et contra*, &c. Thus you plainly ſee, we cannot account for ſuch effects from a mechanical operation, and, indeed, impreſſions on our ſenſes, with regard to the ideas produced, and their effects, are by no means mechanical, or explicable upon any theory we know. Even the changes made on the ſimple fibres cannot be thus explained. The operation of cold is directly contrary to the ſolution of continuity, for it acts by condenſing or encreaſing, and yet this is certainly a Stimulus. In ſhort, we are ſenſible to every mode of motion, if ſenſible at all, and to every condition in which the fibres may be in.

Hence the difference Phyſicians have made between mechanical and chemical Stimuli; the firſt, where the operation can be explained from the figure; the ſecond, where it depends on the operation of ſmall parts of bodies upon each other, from a peculiar property which we do not know. I mention all this, not for any aſſiſtance it will give us in our diſcuſſion, but in order to avoid fooliſh theories. Whatever we ſee ſtimulates the body, we call it acrid, or ſharp. The former term is very proper, but where we ſay the operation depends upon figure, we can explain nothing from it; ſo that the Corpuſcularian doctrine is very frivolous. The operation of *Stimuli* requires a chemical theory, with which we are not yet provided; but although we cannot explain the direct operation, yet we have ſome obſervations to make concerning it.

1. The operation of *Stimuli* is of two kinds; firſt, that which is in common, or general to the ſyſtem, and is liable to affect every fibre; ſecondly, that which is confined to a particular part of the ſyſtem only. Impreſſions, made on our ſenſes, give us a notion of ſpecific *Stimuli*. There are plainly certain parts of the body liable to be affected with particular *Stimuli*, as the eye with the rays of light, &c. The organs of ſenſe are not aſcertained. Five principal are ſuppoſed, but many more are comprehended under the Touch.

All this leads us into the notion of ſpecific *Stimuli*; but we are often apt to be miſtaken, and conceive ſpecifics, where there is only a common and general operation. Thus we are very apt to conſider as ſuch, thoſe medicines which are neceſſarily firſt applied to, and obliged to act on, a particular organ. Thus every medicine which is ſwallowed, muſt firſt thus neceſſarily act on the throat and ſtomach, but is no ſpecific. Thus emetics are ſubſtances of conſiderable acrimony, and ready ſolution; in conſequence of which they ſtimulate the ſtomach, and are thrown out before they arrive at the inteſtines; but we know that, if from difficult ſolubility they do not act upon the ſtomach, they will arrive at the inteſtines, and will alſo act upon theſe. We are very ready to imagine here, that there is a ſpecific action. No doubt emetics are more diſpoſed to operate on the fibres of the ſtomach, and purgatives on thoſe of the inteſtines; but theſe effects entirely depend on the quantity and ſolubility of the medicine, and ſenſibility of the part; nay, even if any of theſe get into the blood veſſels they will act there likewiſe.

2. There is another caſe, in which we may be deceived in the ſpecific action of medicines, *viz.* when they are carried into the blood veſſels. Here we are very ready to call ſuch medicine as operates more on one ſecretion than another, a ſpecific. But here we are apt to be deceived from any circumſtances which may determine the operation to particular organs, *viz.* from particular alliances to certain *menſtrua*, as, *e. g.* that of ſaline ſubſtances with the watery part of the blood, by which means they go off by the kidneys, and thus prove a *Stimulus* to them, without acting ſpecifically: For theſe very ſubſtances may alſo, by other means, be determined to other ſecretions. Thus, if the pores of the ſkin are ſhut, theſe medicines will go off by the kidneys; but if by any means, as lying in bed, they are rendered open, theſe medicines will be determined to that more general excretory, the ſkin: And it is a common obſervation, that the ſame medicine may be indifferently diuretic, diaphoretic, or pectoral; the laſt in ſo far as they promote the ſecretion of mucus in the lungs, the reaſon of which effect, however, is not ſo eaſy to explain.

3. Me-

3. Medicines have been ſuppoſed to have a ſpecific virtue, on a ſuppoſition that they have a peculiar power of altering the texture of our blood, inſpiſſating or attenuating it, *viz.* by preparing a great quantity of matter for particular operations. Thus the operation of Mercury has been ſuppoſed to be ſpecific with regard to the ſalivary glands. Others, however, ſuppoſe that proceeds from the Mercury being more particularly aſſociated to ſuch parts of the blood as paſs by the ſalivary glands, and that hence it exerts its *Stimulus* more particularly there; which otherwiſe it does in common to the whole ſyſtem. Theſe are the arguments which are brought againſt ſpecific *Stimuli*. If medicines, applied to the external part of the body, be abſorbed, and then act always on a particular part, ſuch may be ſuppoſed ſpecific. Again, if in injecting ſubſtances into the blood veſſels, ſuch medicines are always ſeen to exert their effects on particular parts, as, *e. g.* if jalap always purges, and ipecacuanha vomits, ſuch may be reckoned ſpecific, for ſuch medicines muſt be poured out promiſcuouſly on all the glands at once, and ſhould therefore ſtimulate them all alike. At the ſame time, there are ſtill difficulties to obviate the various cauſes, which may determine the operation to peculiar parts. There are who, not conſidering theſe difficulties, have been very fond of ſpecific *Stimuli*. Some thus have ſuppoſed different effects of different medicines acting on the nervous power, and affecting the *Senſorium commune*. Some they have ſuppoſed acting on the organs of voluntary motions, others more particularly on the heart and blood veſſels. Hence has ariſen the diſtinction between Cardiac and Cephalic. But I know no inſtance where ſuch effects take place.

4. Another difference of Stimulants has been made from the degree of force. Linnæus's definition of Stimulants is, *Stimulantia ſecretiones incitant*. This certainly very often they do, by acting on the excretory organ. Formerly, when I talked of my diviſion of medicines, which acted on the fluids, into the *Alterantia* and *Evacuantia*, I obſerved that in theſe the medicines act on the moving fibres, and only from their more direct application to the fibres of a particular

particular organ, excited that evacuation. Here let me add, that, taking any particular part of the body, to which a Stimulant is applied, if excretory orifices be the part, their ſecretion will be produced; if not, the action of the *Stimulus* will extend to the moving fibres of the ſecretory organ, and cauſe a greater flow of blood to the part, and prove *rubifaciens*, which is the firſt appearance of inflammation; and, if the *Stimulus* be ſtrong, inflammation itſelf; and if in a certain degree of inflammation the *rete mucoſum* be affected, raiſe bliſters, and perhaps gangrene. This laſt has given occaſion to a particular term applied, *Epiſpaſtica*, in Latin *Attrahentia*.

Abſtracting from effects upon the fluids, we now go back to conſider the effects of Stimulants on the moving fibres themſelves. Theſe have been diſtinguiſhed into two kinds. Two ſorts of motions our moving fibres are liable to, Contraction and Relaxation. A Stimulus, as producing either a ſingle contraction, or alternate oſcillations, is ſaid to produce tonic or clonic motions. How far this diſtinction is of much uſe, or well underſtood, I am doubtful. I can eaſily ſee the action of the moving fibres depending on the tenſion of the ſimple fibres, and the influx of the nervous power * taken together. I can conceive a medicine producing an influx of the nervous power, and cauſing alternate contractions; but where the fibres, as is ſaid of tonic motions, are ſtill in a condition to perform their functions, that there a ſingle contraction is produced, is impoſſible for me to imagine. For my part, I have no notion of a ſimple contraction, but what is durable, and cannot conceive, that by this means a tone can be given to the parts. What I would underſtand by giving tone to the moving fibres is, (the tenſion of the ſimple fibres being given,) cauſing a greater influx of the nervous power into the parts without contraction. Wherever a ſimple contraction is produced, it is the effect of a ſtronger degree of *Stimulus*, cauſing in the organs of voluntary motion an involuntary contraction, in the involuntary

* The firſt procurable by Aſtringents, the ſecond by moderate *Stimulus*.

organs

organs a firm, fixed, and durable contraction, or what is called Spaſm. If then we diſtinguiſh properly, we ſhall find that ſimple and alternate contraction, differ only in degree, and are not oppoſite; the firſt, or ſpaſmodic affection, produced by the ſtrongeſt degree of Stimulus; the laſt, or what might be called the clonic, by a weaker degree of *Stimulus*, cauſing alternate contraction and relaxation.

EFFECTS of STIMULANTS.

Stimulants extend their effects to parts very diſtant from thoſe to which they are applied; in moſt of them to ſome diſtance, in others to the whole ſyſtem. In different *Stimuli*, their effects differ in degree and kind. Some are diſpoſed to affect diſtant parts, but thoſe very ſlightly. Thus a pimple on the haunch affects, as has been obſerved, the oppoſite ſhoulder; and I myſelf, if a dog with his tongue a little rough licks my hand, feel an uneaſy tickling in the ſoles of my feet. The difference in the effects of *Stimuli* in the parts to which they are applied ſeems to depend on arbitrary laws of the animal œconomy. Thus ſneezing is produced from tickling the noſe, coughing from any part of the *trachæa*, *&c.* People here may talk of conſent of nerves, but this will not anſwer to explain the effect. From theſe inſtances, we can only obſerve, that the effects of *Stimuli* may be ſtrangely diverſified. I entered upon all this, chiefly for this obſervation, that many, and perhaps moſt medicines act on the ſtomach, and, in conſequence of their *Stimulus* there, propagate their effects over the ſyſtem. It is no objection to this, that we are not able to explain the method of their action, on theſe diſtant parts. The action of Stimulants are very much regulated by habit and cuſtom; in ſo far as they act on the organs of ſenſe, repetition diminiſhes the force of the impreſſion; ſo that to produce the ſame effect after a ſhort time, a greater impreſſion is neceſſary, and an increaſed doſe to produce the ſame effect. A difference here occurs in practice, which we do not know very well to diſtinguiſh in theory. There is a difference in the action of *Stimuli* in producing motion or ſenſation. Wherever *motions* are excited

excited by *Stimuli*, repetition renders them more eaſily ſo, and upon ſlighter cauſes; but *Senſations* again upon repetition, are rendered more ſlight. In other words, cuſtom increaſes the facility of *active* motions, and diminiſhes that of *paſſive*. From what I have ſaid of the effect of *Stimuli* producing different motions, they may eaſily be conceived of great number, and conſiderable variety; of greater than I can here enumerate. I have in my liſt neglected the Evacuants, and only ſet down ſuch Stimulants as produce general motions without regard to particular Evacuations.

INDICATIONS of STIMULANTS.

They are indicated in all caſes of languid motion, *i. e.* not merely in weakneſs; but in all caſes where the motion of the ſyſtem is inert, weak, and ſlow.

1. EFFECTS in the SYSTEM of BLOOD-VESSELS.

1. They are indicated, where the motion of the blood is ſuddenly ſtopped, as in fainting, *&c.* 2. Where the degree of languor is neither ſo ſudden, nor ſo inconſiderable, but more permanent in its kind, *e. g.* in the Chloroſis, a diſeaſe often ariſing from affections of the *uterus*; but may alſo ſometimes from other cauſes. Analagous to this is the Cachexy, a complicated term, where in conſequence of various obſtructions of the *viſcera*, a languor and *inertia* is endued in the ſyſtem. Stimulants here are eſpecially of uſe, where that *inertia* is manifeſtly ſo great, as to be attended with ſtagnation of the fluids in particular parts; as in Cachexy with Dropſy; or, as *Materia Medica* writers obſerve, in Phlegmatic habits. 3. Here, and in the following caſe, the *inertia* of the blood-veſſels is of a more ſubtile kind. Stimulants are indicated in Gangrene, which is the effect often of motion and inflammation; but in particular caſes comes on from an Oedematous Swelling, Hydropic and Cachectic ſtate of the body; and in theſe caſes are Stimulants neceſſary. In ſome caſes, even where Gangrene proceeds from Inflammation; *i. e.* when afterwards an *inertia* ſucceds, are

Stimulants

Stimulants found uſeful. 4. They are indicated in Intermittent Fevers, where the returning fit is often obviated by their uſe. I ſhall not here enter into the theory of Fevers, nor conſider whether the *inertia liquidi nervoſi* be that cauſe. It is enough to ſay, that the attack of the paroxyſm is always attended with *inertia*, where it is eaſy to ſee how Stimulants will act. They are alſo recommended in caſes of Continued Fevers, but here their uſe is more uncertain than in Intermittent. Our theory of Fevers renders it difficult to know, when we ought to commence the ſtimulant, or lay aſide the antiphlogiſtic method.

2. EFFECTS on the NERVOUS SYSTEM.

There are caſes where the *inertia* is confined to this. 1. Palſy certainly conſiſts in a weaker flow, or interruption of the nervous power into the part affected. The nature of the obſtructing cauſe there, is not explained. Poſſibly the nature of the Palſy may be ſuch as to be hurt by *Stimuli*; but certainly there are caſes, in which it may be cured by them. 2. Connected with this are other diſeaſes of the brain, Vertigo, Apoplexy, Lethargy, *&c.* all which conſiſt in a weaker flow through the *Senſorium commune*. Apoplexy is generally diſtinguiſhed into ſanguineous and ſerous. The application of Stimulants have been confined to the latter. There may be ſome foundation for this diſtinction, and there may be caſes where there is an obſtruction only in the ſerous veſſels. However, I do not know if this ſhould always make a diſtinction in the application of *Stimuli*. It is commonly thought the ſanguineous Apoplexy only returns three times; but I have known caſes where it has returned oftner, and have ſeen an approaching paroxyſm, indicated by ſtammering, *&c.* obviated by Stimulants, as a little muſtard, *&c.* and even the paroxyſm itſelf relieved by them. If, in conſequence of repeated attacks, thoſe patients to whom I gave Stimulants in ſuch caſes, happened to die, on diſſection there was found all the appearance of ſanguineous Apoplexy, diſtenſion of the veins of the brain, and extravaſated blood. 3. Some ſpecies of Head-ach have been cured by Stimulants, *viz.* ſuch as are attended with pale-

neſs, coldneſs, and languor of the whole body. We cannot here determine the particular part affected; ſometimes it appears to be external, and æther, or bliſters, have given relief; ſometimes, too, it appears to be internal, and an affection of the brain.

EFFECTS in the ALIMENTARY CANAL.

Here thoſe ſymptoms we call nervous, as often appear as any where elſe. Theſe are attended with paleneſs, *&c.* Sometimes they are obſerved to ariſe in conſequence of a bad Chylification and Aceſcency, manifeſtly depending on *inertia*, and languid action, which are relieved by Stimulants. Sometimes they appear in the whole track of the alimentary Canal, from a ſlow motion, occaſioning habitual coſtiveneſs, in which caſe, too, Stimulants and Aromatics are found frequently of uſe. I had occaſion to obſerve, that weakneſs often cauſes ſpaſms, which frequently occur in *inertia* of the alimentary Canal, and may be taken off by Stimulants, promoting ſtronger action. When we come to Antiſpaſmodics, we ſhall explain what concerns this head. Theſe ſymptoms, aceſcency, flatulency, *&c.* appear in hyſteric and hypochondriac caſes, and therefore Stimulants here are frequently indicated. There is another ſpecies of languor when Stimulants are indicated, *viz.* the Gout. The nature of this diſeaſe is ſtill involved in much obſcurity. Whatever diſpoſition it has to appear in different parts, it is certainly connected peculiarly with the ſtomach. It manifeſtly ſeems true, that, to produce the Gout in the extremities, (its proper form,) a ſtrength and tone of the ſtomach, and *primæ viæ*, is neceſſary; for whatever weakens the force with which the Gout is ſent to the extremities, muſt make it return upon the ſtomach.

The difficulty of the application of Stimulants, in theſe caſes, ſhall afterwards be noticed, when we come to particulars.

CONTRA INDICATIONS of STIMULANTS in the SANGUIFEROUS SYSTEM.

1. As in caſes of languid motion Stimulants were indicated, ſo in caſes of increaſed motion theſe are improper. There is no doubt of this, where Hæmorrhage, Inflammation, *&c.* depend on an increaſed *impetus* of the fluids, and in every *diatheſis* where there is a tendency to theſe. In the caſe of Fever, this contra-indication is more complex. Wherever the Fever is in an inflammatory ſtate, Stimulants are hurtful.

Wherever Fever is accompanied with languor and weakneſs, Stimulants are uſeful; but we are not to exhibit them in all caſes where the pulſe ſinks, for that is often attended with inflammation; but where the diſeaſe manifeſtly appears without inflammation, and where its long continuance has weakened the patient, then Stimulants may be uſeful. In general, Stimulants are improper in the beginning of Fevers, and, in the end, allowable.

2. Stimulants are forbid in all Obſtructions, which, though attended with *inertia*, yet from the nature, duration, and degree of the Obſtruction, we know that it is not to be overcome by ſuddenly increaſing the *impetus* of the blood, but that, by this means, we are in danger of fixing it more, or even of deſtroying the ſtructure of the part. If Stimulants, here, be ſlowly thrown in, they, however, may be uſeful; but here the moſt neceſſary means are, relaxing the ſpaſms, and diſſolving the fluids.

3. Stimulants, wherever the ſolids are over-ſtretched, or wherever, from other cauſes, they are rendered tender and friable, *rupturæ proxima*, as it is called, are contra-indicated. This they are in all caſes where the fluids are remarkably thin and acrid. Here I have in view two caſes, Cachexy and Scurvy. By the former, if Phyſicians mean any thing at all, they generally mean obſtructions in the lower belly, where, in many caſes, Stimulants would rather have

the effect of fixing the Obſtruction, and deſtroying the part, from tearing the ſolids already over-ſtretched, and rendered friable by acrimony. This gives a caution to what we ſaid of the uſe of Stimulants formerly in Cachexy. In the Scurvy, where the fluids are ſo acrid as to have eroded the veſſels, being poured out, and have cauſed Obſtructions, Stimulants are entirely hurtful. We do, indeed, ſometimes uſe Stimulants in this diſeaſe, but they are of ſuch nature as only to promote ſome excretions, without producing motions, and extending their effects over the whole of the ſyſtem. In general, I may obſerve, that I do not extend what I have ſaid on the ſubject of the contra-indication of Stimulants, to their effects on the ſecretions.

REMARKS with regard to the USE of STIMULANTS.

The frequent uſe of Stimulants deſtroys the tone of the moving fibres, and diminiſhes the mobility of the nervous fluid. Whatever may be in this laſt effect, there is one obſervation which ſerves to confirm the firſt; Nature ſeems to have adapted our organs to the reliſh of the mild and bland, for ſuch are the ſubſtances we employ in food, and univerſally has ſhe given us an averſion to the poignant and ſtimulant. With regard to the mild and bland, with them no perſon is naturally palled, but there are always inſtances, through the whole of life, of perſons entertaining an averſion for the ſtimulant. Medicines are diſtinguiſhed as active, acrid ſubſtances, and an averſion to ſuch is univerſally eſtabliſhed, and therefore Stimulants are ſuited to the body as medicines, but, in the main, they are hurtful to the ſyſtem, and tend to deſtroy its tone. Hence, then, we ſhould avoid Stimulants as much as poſſible, ſince, to produce their firſt effect, they always require a ſtronger and ſtronger doſe; ſo that, at laſt, ſo much is neceſſary as will deſtroy the tone of the ſtomach, and that of the whole ſyſtem. In the firſt part of life, Nature has wiſely given us moſt averſion to theſe, as then they would be moſt hurtful, and, before the natural duration of life was at an end, would require to be given in ſuch quantity as would totally deſtroy us; in the latter part of life we come to reliſh them more,

more, as then the time we have to live is ſhorter, and, conſequently, the danger leſs.

As to their uſe, therefore, in general, we ought, wherever they are neceſſary, to begin with ſmall doſes; ſo that if a long continuance of them is neceſſary, we may increaſe the doſe without danger. Whatever diſeaſe requires Stimulants, we at firſt reap good effects from them, but afterwards, from habit, theſe effects are deſtroyed. Hence, then, when we can, we ought frequently to interrupt their exhibition, in order to interrupt the habit by which by which their effects are loſt. Nothing is more common than Phyſicians preſcribing a medicine for years, *&c.* but certainly it would be much better to order an intermiſſion, and perhaps by this means we ſhould attain our effect better at the laſt, and beſides could frequently recur to the ſame courſe with advantage.

There is, however, one exception to this rule of beginning with ſmall doſes, and that is, wherever a ſudden effect is to be produced. This I have frequently ſeen in the uſe of Opiates; where conſiderable effects might have been certainly obtained by a full doſe at firſt, which could not be attained by ſmall ones frequently repeated and encreaſed. This exception moſt generally takes place with regard to Stimulants, which act as antiſpaſmodic.

The principal purpoſes of Stimulants have been now marked out, but theſe effects are ſeldom obtained by the Stimulants, we are to talk of. Debility is much better remedied by cold air, cold bath, exerciſe, diet, *&c.* Theſe, indeed, might be called *Stimuli*, but ſurely there is a great difference between theſe, and the ſtimulant medicines we are to talk of; ſo that unleſs very immediate effects are wanted, theſe muſt be laid aſide; for by the means juſt now mentioned, we ſhall obtain the ſame effects, much more durably, and with much leſs hurt to the ſyſtem. Hence the uſe of Stimulants has declined of late, and does ſo daily, and many are marked in our Catalogue, which are diſregarded in practice, and known only in our Diſpenſatory liſts.

FOUN-

FOUNDATION of STIMULANT VIRTUE in SENSIBLE QUALITIES.

In general, a Stimulant virtue is diſcovered by a ſtrong taſte, and odour; and all ſubſtances, which make a ſtrong impreſſion on our ſenſes, may be conſidered as ſuch. It is difficult to diſtinguiſh them all here; as ſome of theſe may be ſedative, and ſome antiſpaſmodic; but even theſe have always more or leſs of a ſtimulant virtue. From fragrancy of odour, or even ſtrong poignancy, we are not immediately to infer a ſtimulant quality. Fragrancy of odour often depends on the volatility of a ſmall part of the whole; Poignancy on the *extreme* volatility of the part, which may be in ſo inconſiderable quantity, as to be a medicine of little virtue, though at the ſame time ſo volatile, as in this manner to affect our ſmell. From an acrid taſte more is to be inferred. However, here we muſt be aware, that from the operation on the tongue, we cannot always judge of what it will be in the ſtomach. Some medicines which are not acrid, will ſeem ſedative to the tongue, and within the ſtomach prove ſtimulant; and again, ſome are ſtimulant to the tongue, which prove ſedative in the ſtomach. Different Stimulants have different qualities, which poſſibly might be diſcerned by a difference of acrid taſte. This we refer to particulars, as we are not in a ſtate to give any general rules with regard to it.

We ſhall next enquire into

What PART the STIMULANT VIRTUE is lodged.

Very univerſally in the eſſential oil of plants. The ſaline part of plants is not remarkably ſtimulant. Wherever, therefore, we have means of diſcovering eſſential oil, we alſo in ſome meaſure have the power of judging of a ſtimulant virtue. Here we are apt to be deceived. We muſt not imagine, that becauſe a plant gives out an eſſential oil by diſtillation, that theſe plants are ſtimulant; for many ſuch are of a very mild nature. Again, ſubſtances acrid to the taſte

taſte give out a mild oil; as that of Cloves, hence the acrimony would ſeem not always to reſide in the eſſential oil. It is ſaid to be lodged in a reſin, which I contend is the ſame thing; as the medical virtue of theſe depends on an eſſential oil. Acrimony often ſeems to be lodged in a gummy matter, ſoluble in water. The acrid part is ſaid to be extremely volatile, and not to be obtained in the form of eſſential oil; as in the *Siliquoſæ*, Muſtard, and others of the Creſs kind; in which it is ſuppoſed the acrimony is not lodged in the eſſential oil, but in a ſubtile volatile part diffuſible, in water. But I find that, on proper examination, an eſſential oil may be obtained from theſe, containing all their acrimony; and I am inclined to believe their acrimony is lodged in an eſſential oil; though that be extremely volatile, and in ſome meaſure mixed with water. Becauſe the acrid part is ſometimes fixed, ſome think it is not in the eſſential oil. This is not concluſive, as ſome oils are fixed, not riſing with water or boiling alcohol; *e. g.* Cloves, a very acrid ſubſtance, gives over a very mild oil, even with alcohol, and leaves in the diſtilling veſſel an acrid extract, of conſiderable virtue, and too much neglected in the practice of Phyſic, which probably has its virtue depending on an eſſential oil; tho' ſome think it reſides in a gummy matter.

PHARMACEUTICAL TREATMENT.

Moſt properly, and very univerſally, are our acrid Stimulants to be extracted by alcohol. In ſome it may be extracted by water, but there is a ſuſpicion, that the ſame impregnation is not to be obtained as by alcohol. We ſhould firſt digeſt with the alcohol, and then concentrate our impregnation, by diſtilling off part of the alcohol. By this means, much purer and finer oils are to be obtained than any in the ſhops. Dr. Boerhaave directs this method for Saffron; but it may be applied to many other plants.

There is a very common preparation in the ſhops, *viz.* an impregnation of eſſential oil with water, in what is called diſtilled waters. This impregnation with water is not always obtained, and the oil

is

is often ſo fixed as not to riſe. Altho' the ſtimulant power may reſide in the particular part of the plant, yet we often find the ſubſtance of ſuch texture, that we cannot procure its eſſential oil, without giving more acrimony than before; which, tho' not a formal empyreuma, is often ſo great, as to render the medicine unfit for internal uſe. All this would lead us to uſe our Stimulants in ſubſtance, ſince we find there is in the plant a virtue not to be procured by any extract, and, in many caſes, we can make a better ſolution in our ſtomach than any where elſe. With regard to uſing the Stimulants in ſubſtance, we muſt be aware of the method of preparing them; for, in drying and powdering, the volatile part, and, with it, the virtues are often loſt; ſo that, indeed, it ſeems to be a doubt whether Stimulants ſhould be exhibited in this manner. If the oil is of a fixed nature, there may be caſes where this method is preferable, and ſome Stimulants I have often ſeen anſwer in this manner better than any other way.

PARTICULAR STIMULANTS.

After having ſaid that every ſubſtance, which had ſmell or taſte, might be reckoned a Stimulant; you will eaſily ſee they muſt be of great variety. Perhaps we have already delivered their virtues, but there is a greater variety and difference in quality, than is commonly imagined. Many Evacuants and Antiſpaſmodics have been introduced under this title by *Materia Medica* writers.

In my liſt, I have followed, in arranging my plants, the botanical analogy, and then that of the ſenſible qualities. At firſt, I had ſet down a liſt of foſſile Stimulants, but I now find that theſe will better come under the heads of Antiſpaſmodics, or Evacuants. Oppoſite to *a* is placed the term

VERTICILLATÆ.

This is a very natural order, well known among the Botaniſts, and a very complete one; eaſily known, as they agree in many common marks. Their virtues are very much in common, and might be

be given in very few words, but that *Materia Medica* writers have diſtinguiſhed, and, as uſual, diſtributed their virtues. To this I have had a view in the blank ſpaces left between ſome of this liſt, intending in one to comprehend the Cephalic, *&c.* In general, all are antiſpaſmodic, and may be uſeful in *frigidis cerebri morbis.* All may be antiſpaſmodic in affections of the breaſt, may ſtimulate the ſtomach, and be antiſpaſmodic there, may ſtimulate the ſyſtem in general, and be alexipharmic. Some, however, are peculiarly adapted to each of theſe heads, and diſtributed accordingly, according to the method of *Materia Medica* writers; my firſt ſet are the

CEPHALIC VERTICILLATÆ.

Theſe are, in general, grateful to the nerves, exciting the nervous power, and adapted to all cold diſeaſes of the head, Lethargy, Apoplexy, Palſy, *&c.* Weakneſs of Sight, Giddineſs, and Weakneſs of Memory, and many other diſeaſes. All this I give you as an inſtance of the method in which *Materia Medica* writers laviſh out their virtues. In general, they are ranged in alphabetical order, except where two correſponding ſpecies are put together.

BETONICA, BETONY.

Materia Medica writers, in ſpite of the want of ſenſible qualities, or teſtimony of Phyſicians, have been laviſh of their virtues. Geoffroy gives us a catalogue, about a page long, merely on the virtues of Betony. After all, very little virtue is found in it. It is a mild Sternutatory, and, as ſuch, will be mentioned in the claſs of Errhines. It has been ſaid to be hypnotic and anodyne, by Pauli; and, by better authority, Bartholine. Not any ſuch virtue appears in the bark, or leaves. The root is an acrid, emetic ſubſtance, and perhaps may contain virtues of ſome conſequence. The *Veronica* is joined by Cartheuſer in the ſame ſection with Betony, though of a different natural order, and ſenſible qualities. Perhaps he was led into this by confuſion of names, as the Betony has been called *Ve-*

tonica. This confuſion of names has, perhaps, alſo occaſioned a confuſion of virtues.

MELISSA, BALM.

Many virtues have been attributed to this. In ſenſible qualities it is the weakeſt of its claſs. It gives a weak diſtilled water, and a weak ſolution.

LAVENDULA, MAJORANA, MARUM VULG. ROSMARINUS; LAVENDER, MARJORAM, MASTIC, ROSEMARY.

All theſe yield a large proportion of eſſential oil, and are of a fragrant odour, whence their aſcribed cephalic virtue. In any quantity in which we employ them, or any impregnation which we obtain from them, their virtues are not remarkable. Wherever the virtue depends on eſſential oil, it may prove inflammatory, and hurt the ſtomach.

STOECHAS ARABICA, DICTAMNUS CRETICUS, FRENCH LAVENDER, DITTANY of CRETE.

As the growth of warm countries, theſe contain more acrid eſſential oil, and more powerful virtues. They cannot be brought into this part of the world without loſing much of theſe qualities, ſo that they are properly neglected in our ſhops.

CALAMINTHA, CALAMINT;

A ſpecies of Meliſſa, which ſhould, perhaps, have been placed among the ſtomachics. It is a weak, inſignificant plant.

PECTORAL VERTICILLATÆ.

HYSSOPUS, HEDERA-TERRESTRIS, PULEGIUM. HYSSOP, GROUND-IVY, PENNY-ROYAL.

Various have been the acceptations of the term Pectoral. I mean by it, ſuch as have the power of promoting the ſecretion of *mucus* in

in the *bronchiæ*. In innumerable inſtances I have been able to obſerve no pectoral virtues in theſe, they giving no relief in pectoral caſes by promoting the expectoration. Ground Ivy has been much talked of. Some tell us it will alone cure diſeaſes of the breaſt, and, what to me ſeems impoſſible but by the Surgeon's inſtrument, an Empyema. I can find no foundation for thoſe properties. Hyſſop is a medicine of more virtue, but properly now neglected, as of the ſame claſs of the more active *Pulegium*. Hyſſop * is ſaid to prove effectual to dizzineſs, when ſoftened in warm water. In Ecchymoſes, Riolan goes ſo far as to ſay, it ſucks the blood out of the part, which was ſeen on the cloth. You ſee how difficult it is to truſt *Materia Medica* writers. I have tried Hyſſop in ſuch caſes, and found no other effect than from the application of any other aromatic. Pulegium is a powerful Antiſpaſmodic, but has little pectoral virtue. It is ſaid to have been uſeful in the Chin-cough, which is a diſeaſe purely ſpaſmodic, where, from its antiſpaſmodic virtue, it may be of advantage. Some women have their *menſes* with difficulty, which have ſpaſms, *&c.* excited in their ſtomach, where I have found Penny-royal tea to be of real ſervice. Hence I have placed it next to, and perhaps it ſhould ſtand in, the next diviſion.

STOMACHIC VERTICILLATÆ.

MENTHA SATIVA & NEPETA, COMMON and CATMINT, are conſidered as Stomachics, but are weak.

MENTHA PIPERITIS, PEPPER MINT.

This is a chief Aromatic and Stimulant, and one of the few ſubſtances for which we have been obliged to the attention of the Botaniſts. It is one of the moſt ſubtle and penetrating of its claſs.

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* In one of the original copies no mention is made of its virtue in dizzineſs, which word, I apprehend, was miſtaken for *diſcuſs*. The whole ſentence ſtands thus: "Hyſſop, when ſoftened with warm water, is ſaid effectually to diſcuſs Ecchymoſes. "Riolan goes ſo far, *&c.*"

Its action is quick and vivid, and as quickly diffuſed over the ſyſtem as any I know. There is a difference in the action of *Stimuli*; ſome act on the part to which they are immediately applied; ſome, like the Pepper-mint, do not affect that part ſo peculiarly, but in a more equal manner extend their action over the ſyſtem. Thoſe which act chiefly on the part to which they are firſt applied, are apt to excite inflammation. The *Mentha piperitis*, as not having this inconvenience, is a valuable medicine. Its virtues are, to be antiſpaſmodic in the ſtomach, and, in ſome meaſure, over the ſyſtem.

The Spear-mint, and other ſpecies, have all the ſame qualities, only in leſs degree; are leſs extenſive in their action, and more apt to produce inflammation. The *Pulegium*, in a dry ſoil, comes neareſt to the Pepper-mint. *Nepeta* approaches to the Mint in appearance and virtues. All, you ſee, are antiſpaſmodic, whence you underſtand their ſtomachic quality. I can ſee no foundation for the Aſtringency aſcribed to Mint, much leſs for its anti-venereal qualities, it being, as poſſeſſing ſuch, ſuppoſed to reſtrain the ſeminal ſecretion, and its irregular excretion in nocturnal pollutions. As ſuch caſes occur, at leaſt to me, in lax, moveable ſyſtems, I have found Antiſpaſmodics, eſpecially Camphire, uſeful; and, poſſibly, Pepper-mint, if it could be rendered as durable in its operation, might have much the ſame effect. Here is an inſtance of the weakneſs of *Materia Medica* writers, in collecting the virtues of plants. Simon Pauli ſays, that if a vein of the foot be cut, and the part immerſed in decoction of Mint, no blood will flow from the orifice. Nobody can doubt but that the vein was improperly opened. This ſhews the frail foundation on which ſtand many of the virtues of the *Materia Medica*.

MARUM SYRIAC. SATUREIA, SERPILLUM, THYMUS. SYRIAN MASTIC, SAVORY, MOTHER of THYME, THYME.

Theſe four are not peculiarly adapted to any particular part of the body. Theſe are the moſt acrid and conſiderable Stimulants of the claſs.

claſs, good Antiſpaſmodics in the ſtomach, but more liable to produce inflammation. The two firſt are the moſt penetrating of them. The Serpillum is the warmeſt our climate affords. In ſlight infuſion, as tea, it is grateful to the ſtomach. This ſhewed me the difference of Indian teas from warm water, which, of itſelf, has relaxing effects, which may be obviated by this, and other ſuch Aromatics. Serpillum affords an agreeable diſtilled water, which ſhould be in common uſe; it is more durable, but leſs active and penetrating than Pepper-mint. The Thyme is leſs aromatic, and contains leſs eſſential oil, with more bitterneſs, and more manifeſt aſtringency. Its uſe in medicine is not aſcertained. It is commonly mentioned as alexipharmic, but on what grounds is dubious.

SALVIA, CHAMÆDRIS, SCORDIUM. SAGE, GERMANDER, WATER GERMANDER.

Theſe are commonly ſaid to be alexipharmic, the meaning of which is not clear. That they are uſeful in promoting ſweat, may be in common with them, and others of the claſs, when given with much warm water. That they expel the morbific matter of contagion, or of fevers, I will not allow, as I do not underſtand it. Chamædris enters into our gout powders. That ſuch a bitter aromatic may be uſeful I will not deny; but how it comes to prevent the appearance of the gout in the extremities, we ſhall talk of when we come to the other ingredients which enter our gout powder.

The uſe of theſe plants I have found hurtful by long continuance. From the uſe of Sage-tea, I have ſeveral times obſerved a ſtiffneſs of the eyes enſue, the *palpebræ* not moving on the ball of the eye, and the eye liable to ſuffuſion and inflammation. There are many other bitter plants to whom this quality has been aſcribed.

Oppoſite to *b* ſtands the title

2. UMBELLATÆ.

This order is as entire and ſtrictly natural as any other. Here the botanical analogy, applied to the *Materia Medica*, does not anſwer

ſwer well. All that are ſet down, are ſafe and innocent; but there are many of the ſame claſs, which we know to be of a poiſonous nature. The former order mentioned, the *Verticillatæ*, and the following, the *Siliquoſæ*, have no exceptions of this kind. The whole of thoſe two orders have more of a common property, and none of them have a poiſonous quality. This is not the caſe in the *Umbellatæ*, where it would be dangerous to puſh the botanical analogy beyond thoſe ſubſtances which we have experienced. I have ſet down here moſt of this claſs, which are employed in medicine. In this liſt I have choſen to ſet down only thoſe which are more ſimply ſtimulant; without any evacuant or antiſpaſmodic qualities. Of moſt of thoſe ſet down, the part in uſe, and in which their virtue reſides, is the ſeed. I imagine moſt of the ſeeds of the *Umbellatæ* are of the ſame kind, but of this am not certain, but at any rate the analogy cannot be drawn to the leaves and roots. The Coriander ſeeds are agreeably aromatic, but come from a plant fœtid, and ſuſpected of poiſonous qualities. This has made people afraid of the ſeeds, but practice ſhews that they are perfectly innocent, when freed from any taint of the odour of the leaves. What is the effect of the leaves of the plants, is not known. Some of the leaves have leſs acrimony than the ſeeds. The leaves of the *Daucus Creticus*, and the roots of the *Fœniculum*, are neither of them remarkably acrid.

There are four plants in this liſt whoſe roots are remarkably medicated, *viz.* the *Angelica*, *Leviſticum*, *Pimpinella ſaxifraga*, and *Seſeli Maſſilienſe**. The roots of theſe four contain much of a warm aromatic reſin, which they afford in an elegant form, when wounded in the ſpring; and it is to be lamented, that pains are not taken to collect our native reſins of this kind. The *Pimpinella ſaxifraga* ſtands in the alexipharmic powder of Stahl, ſo much commended by him and his followers. For my part, I am uncertain as to its uſe, but certainly it might be applied to uſeful purpoſes. The ſeeds

* In another Copy, the *Hippoſelinum* is mentioned, inſtead of the *Seſeli Maſſilienſe*.

of

of the *Umbellatæ* are what are chiefly known in medicine. Theſe have all one common virtue. They are all in the common language carminative, *i. e.* antiſpaſmodic in the *primæ viæ*, aſſiſting digeſtion, relieving head-achs ariſing from crudity, diſpelling flatulencies, and curing cholics. Theſe virtues are certainly real, depending on an eſſential oil manifeſt in all theſe plants, which is remarkably aromatic, without acrimony, or ſuſpicion of being of an inflammatory nature, and are, therefore, the ſafeſt of the *aromata* we can uſe in theſe intentions. As natives of Europe, they ſeem intended by nature for theſe cold climates, where there is ſo great a tendency to Inflammation. Hence they are very proper condiments for animal food, for which we improperly ſubſtitute the *aromata* of the Torrid Zone, which are deſigned for vegetable aliment, and are of an acrid inflammatory nature.

The ſeeds of the *Umbellatæ* ſeem peculiarly adapted in the caſe of children. Theſe, from the aceſcency of their milk, are liable to cholic pains. Spirits, and weak punch, are often very improperly employed by the nurſes. Aniſe ſeeds are very effectual for the purpoſe, as they act in an inconſiderable ſmall doſe, and therefore are ſafe, either as they are not in hazard of inducing bad habits, or ſtimulating too much. Theſe are their real virtues. Many others are attributed to them. They are ſaid to increaſe the milk of nurſes. They do, indeed, come off unchanged in it, and ſometimes, by condiment of this kind, given to the nurſes, I have ſeen them ſo far conveyed to children, who laboured under Colics (either from their natural diſpoſition, or from the nature of the milk) as to obviate entirely theſe complaints. It may be ſuppoſed, that as they paſs unchanged, they may ſtimulate the excretories, and give milk; but for my part, I think this is injudiciouſly attempted, by any thing but proper nouriſhment, and if this fails, the complaint lies too deep for any medicine, by ſtimulating the excretories, to have effect. They are ſaid to be diuretic, and the *Daucus ſylveſtris* has been employed for this effect; but I could never, even in conſiderable doſes, obſerve its diuretic virtues. Though it may be ſaid that it

paſſes

paſſes unchanged, yet its *ſtimulus* is ſo ſmall that it would not produce the effect, much leſs in the ſmall quantity in which it is given; and beſides, I doubt the fact alledged, of its paſſing unchanged. Many others of the ſame claſs are ſaid to be diuretic. As Antiſpaſmodics, they may be uſeful in relieving the ſymptoms of Gravel in the kidneys, which may be conſidered as a ſpaſmodic affection. This is an inſtance of the method I would chuſe, in endeavouring to find out the myſterious virtues applied to medicines. Theſe ſeeds, as diuretic, are ſaid to be pectoral. I believe that if they were diuretic, they might alſo promote the ſecretion of mucus in the lungs; but as I ſuſpect their diuretic virtues, much more muſt I do this. Here I would give you a caution, *viz.* that ſurely in inflammatory caſes, the miſchief they would do by their ſtimulant quality from their eſſential oil, would do much more than compenſate any good they might effect from their evacuant virtue. Several of this tribe have been called Emmenagogue. When I come to the operation of theſe medicines, I ſhall ſhew, that there is ſcarcely any medicine ſpecifically ſtimulating the *uterus*. As being of the *Verticillatæ*, they may, from their antiſpaſmodic virtue, be accidentally uſeful, in ſpaſms of the *uterus*. With little judgment have theſe ſeeds been diſtinguiſhed into the *Calida majora* and *minora*. The *Fœniculum*, though one of the mildeſt, is ranked among the *majora*; the *Daucus Creticus*, though one of the moſt acrid, among the *minora*. What is preciſely the rank of the different ſpecies, here mentioned, is not aſcertained. It will not be difficult to do it from their taſte, and the quantity, and the acrimony of their eſſential oil.

Oppoſite to *c* is placed the title

3. SILIQUOSÆ.

This is another natural order, without any exception from ſome of them having poiſonous or deleterious qualities, and in general more exactly agreeing in quality, than the plants of any other natural order. I have confined myſelf to thoſe which ſtand in our diſpenſatory liſts. The others, as containing leſs of the common virtue, are neglected.

neglected. They are all ſubſtances of acrimony, and ſo are properly ranked among the Stimulants; but this acrimony is in ſo ſmall a quantity, as to be ſo eaſily diſſipated by boiling, that many of them enter into our food, and are properly, in theſe northern climates, employed as condiments with our animal food*. The ſhare theſe ſubſtances have in aliment, I have formerly mentioned. As Medicines, they act ſuddenly and powerfully, and their *Stimulus* is quickly diffuſed, ſo that they are uſeful in all thoſe caſes where the motion of the nervous power is languid, weak, or obſtructed, as in paralytic and apoplectic caſes; where I have found no *Stimulus* better (as I formerly obſerved) than a little Muſtard. Habit wears off theſe effects, and I have frequently ſeen Horſe-radiſh, when Muſtard failed, ſubſtituted with advantage. Uſed internally for any length of time, their effects, through habit, come to be trivial. Externally they are uſed with better effect, as we can encreaſe their power, by encreaſing the ſurface to which they are applied; but it is difficult to get it with its proper qualities in that powdery form, which is here neceſſary. They have likewiſe an inconvenience, that, retained long on the ſkin, they are apt to be inflammatory, which is not near ſo uſeful as their firſt extenſive impreſſion. In moſt caſes we ſhould ſeek for the firſt operation, and avoid the laſt. As confined to a particular part in their action, we ſhall talk of them under the head of *Attrahentia*. They prove particular *Stimuli*, not from any ſpecific virtue, but according to the place to which they are applied. Thus, in the ſtomach, while they act as promoting digeſtion in general, and as carminative in diſpelling crudities, if ſtrong they will prove emetic. Accordingly Muſtard and Horſe-radiſh are employed as gentle Emetics, as they are ſubſtances thrown up at firſt, and without continuing their effects. When the ſtomach is once ſet in motion, the vomiting, if that be found neceſſary, may be continued by repeated draughts of warm water, or with ſome of theſe *Stimuli* in it. The beſt method of exhibiting Muſtard, as a vomit, is, firſt to give a table ſpoonful of it, diffuſed in a glaſs of

* Promoting thoſe ſecretions which take off the alkaline part of our blood.

warm water, and afterwards, to add a little Muſtard to every ſubſequent draught. Others are fond of Horſe-radiſh in a ſtrong infuſion, of which a ſpoonful is given in warm water. In my opinion the Muſtard is preferable; for the Horſe-radiſh, as very volatile, loſes its virtue, when kept, and, even in infuſion, is liable to the ſame inconvenience, except that is performed in very cloſe veſſels; nor when the infuſion is obtained, can it produce the effects propoſed without large and nauſeous draughts frequently repeated. If the emetic virtue of theſe ſubſtances does not take place, they are carried into the inteſtines, which they ſtimulate, and promote the evacuation by ſtool. In order to obtain the purgative effect, the ſeed is given entire; *i. e.* in the Muſtard, commonly in the doſe of a table ſpoonful. Of the ſame ſeed powdered we could not give ʒj. without vomiting, whereas I have ſeen even two table ſpoonfuls unbruiſed, which is ℥j. given without that effect. In this manner, Muſtard ſeldom fails to move the belly, and anſwers very well for keeping a coſtive habit regular. Its effect in this caſe is difficult to explain. We can only ſuppoſe, that it is not extracted in ſufficient quantity in the ſtomach to act as emetic, but is carried into the inteſtines, whoſe contents it ſtimulates them to diſcharge, in conſequence of its quantity and ſucceſſive action. Upon the ſame footing it may go farther into the ſyſtem, before it has exerted any *Stimulus* ſufficient to throw it out of the body. If given entire in ſuch quantity as neither to vomit nor purge, it will enter into the blood veſſels, where it is directed to the kidneys, and ſhows diuretic powers. All diuretics, by proper management, may be rendered diaphoretic. If the ſurface is kept warm, the medicine goes off by the ſkin; if it is cool, an encreaſe of urine is effected, and the medicine is determined to act upon the kidneys. In this manner ſome of the *Siliquoſæ* have been employed as ſudorific, and a Muſtard-whey has been given for this purpoſe. Here, as depending on its general *Stimulus*, the warmth of the whey to which it is joined, and the diaphoretic regimen, are its effects to be explained. All the *Siliquoſæ* are ſomewhat of the ſame kind.

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In conſequence of their diuretic and diaphoretic powers, and their promoting the excretion of the acrid parts of our blood, have the *Siliquoſæ* generally, and not improperly, got the title of Antiſcorbutic, which every medicine is ſuppoſed to be, which promotes urine, without any conſiderable heating quality. The only cure of Scurvy is from throwing in a large quantity of vegetable aliment. As this claſs, then, are uſed in food, as they can be taken in conſiderable quantity, and as they are likewiſe proper as medicine, they are, without doubt, peculiarly adapted to this intention. As diuretic and diaphoretic, it is probably not without reaſon they are called pectoral. Something ſeems to be in common with the ſurface of the lungs and the ſkin; and Dr. Hales has ſhown, that a good deal of what we call ſenſible perſpiration, goes off by that organ. As then the kidneys have an intimate connexion with the ſurface of the body, and as that again is connected with the lungs, it is probable that medicines which ſtimulate the kidneys and ſkin will likewiſe have effect upon the lungs, by cauſing ſecretion from their ſurface. Although it is difficult to explain, they ſeem to have a power of ſtimulating the mucous glands of the lungs, and it is probable, that in this way they are ſo often uſeful in diſeaſes of the breaſt. Externally applied to the excretory ducts of theſe glands, they ſtimulate them, and hence are ſo often mentioned as curing hoarſeneſs. *Eruca* and *Eryſimum*, when freſh, are famous for this uſe. In producing this effect, they are ſaid to add more than natural clearneſs to the voice: Whence, in French, one of them is called *Herbe aux Chantres*. The method of uſing them is to make them into a ſyrup, a ſmall quantity of which is laid on the tongue, and ſwallowed ſlowly, by which means they come to be applied to the mucous glands of the *Trachæa*, whence we may ſuppoſe their action extended to the *Bronchiæ*. Theſe virtues I have had confirmed by experience, but have not confined myſelf to the *Eruca* or *Eryſimum*, but have uſed the Horſe-radiſh with the ſame advantage. Theſe are the common virtues of the order. The particular ſpecies of this order only differ in degree of virtue, *i. e.* in proportion as they have their acrimony more or leſs in compariſon to the other parts. With regard

to their order in point of ſtrength, it does not appear to be properly determined by experiment. We ſhall only obſerve, that the Muſtard, as a ſeed, the Horſe-radiſh, as a root, and the Scurvy-graſs, as a plant, are probably the ſtrongeſt of the kind, and thoſe we are beſt acquainted with.

The virtue of theſe Stimulants (as of moſt other claſſes) are not accompanied with other qualities, Bitterneſs, Aſtringency, &c. The *Siliquoſæ* have indeed a bitterneſs in common to the whole claſs, from their peculiar acrimony. Some, however, are ſaid to be aſtringent. The *Burſa paſtoris* has been ſaid to be ſo, but, upon trial, I have found little qualities in it. The virtue of the *Siliquoſæ* is not only more in common, but more equally diffuſed over the plant, than in any order I know. If there is any diſtinction to be made, I think the ſtrongeſt acrimony is lodged in the ſeeds, the next ſtrongeſt in the roots, and the weakeſt in the leaves. Hence theſe laſt are the moſt proper Antiſcorbutics, as they can be thrown in both as a food and as a medicine, in the greateſt quantity. The virtue of all theſe reſides in a very volatile ſubſtance, for it is diſſipated in drying. When freſh, this volatile principle comes over from the plant, in diſtillation with water. Hence it has been ſuppoſed of a ſaline nature, but more accurate enquiry now ſhews us, that it reſides in an eſſential oil of this peculiar property, that, though extremely volatile, it is yet ſpecifically heavier than water. It remains (for I have not tried it) to enquire whether this oil has the ſame volatility when ſeparate, as in the plant. It muſt not only be ſtopped with common ſtoppers, but kept with water under ground. It may be a ſubtle ſpiritus rector, a ſmaller portion of the oil that is thus diſpoſed to fly off. With this acrid, volatile, eſſential oil, theſe plants ſhew they alſo contain an expreſſed oil, which is not only a curious fact in chemiſtry, but alſo in the anatomy of the plant, and which we ſhould not have expected *à priori*. Theſe two oils are lodged in different parts of the ſeed, otherwiſe, on expreſſion, a part of the eſſential oil would always come away with the expreſſed.

As to the exhibition of theſe ſubſtances, they always ought to be given in ſubſtance entire, eſpecially in the Scurvy, in order that we may give a vegetable aliment along with our medicine, without which the Scurvy cannot be cured. The eſſential oil of the plant, though diuretic, *&c.* would not anſwer, unleſs alſo the expreſſed oil were joined with it, in the entire ſtate, to aſſiſt in affording the aliment we ſpoke of; and I am perſuaded, that though the eſſential oil were never ſo well extracted and preſerved, it could never cure the Scurvy. Though this be really the caſe, yet if the eſſential oil could be extracted at a moderate expence, or give a ſtrong impregnation to ſpirit, it might ſerve for other purpoſes in which theſe medicines were recommended, eſpecially in paralytic caſes. In the mean time, we know no other preparation but the ſyrup, which anſwers not only for hoarſeneſs, but in paralytic caſes, and, as I have ſeen, in pectoral. In making this, we ſhould confine ourſelves to the ſeeds and roots. Horſe-radiſh is the moſt fit of any. This is not ſo ſucculent as that it can be extracted by expreſſion. As a very volatile ſubject, it ſhould be taken freſh, ſcraped down quickly, and let fall into water, to prevent the effects of air, then ſhut up in cloſe veſſels, and ſet in balneo, and, after ſtanding there for ſome time, be taken out, and expreſſed upon a ſufficient quantity of ſugar, with which it may be again committed to the bath, with the ſame precautions, and afterwards corked up in ſmall veſſels, in order that, when it is opened, it may be quickly conſumed, and have as little of the bad effects from the air as poſſible.

Oppoſite *d* is placed the term

ALLIACIÆ.

Though of a very different botanical tribe, I have ſet theſe down immediately after the *Siliquoſæ*, as agreeing with them very much in medicinal virtues and chemical qualities. Even in ſenſible qualities there is a reſemblance, and one of the *Siliquoſæ* is called *Alliacia*, from its alliaceous odour. The *Alliaciæ* and *Siliquoſæ* agree, too, in having their virtue reſiding in a volatile principle, and in having that volatile principle reſiding in an eſſential oil, which ſinks in water.

water. The only difference is, that the *Alliaciæ* contain more of a mucilaginous matter, which, when their acrimony is diſſipated by boiling, ſhews more of a nutritious, and, if you will, demulcent quality. Neither, indeed, is their acrimony ſo volatile, or ſo immediately active as that of the former claſs, nor ſo extenſive in the propagation of their ſtimulus, if they are equally acrid. Hence they are not ſo frequently employed in paralytic caſes; but, bating theſe differences, their diuretic, diaphoretic, and pectoral qualities, ſtand upon the ſame footing as thoſe of the *Siliquoſæ*. There is, too, a farther analogy, that, if exhibited in the ſame manner, they are apt to affect the ſtomach with pain and vomiting. If intended to be conveyed into the maſs of blood, they ought to be exhibited in their entire texture. Thus the cloves of Garlic ought to be dipped in oil, and ſwallowed entire, for the common Garlic pill will ſeldom prove diuretic. Sometimes, indeed, that pill grows pectoral, but never ſo conſiderably as in the other manner. The Syrup of Garlic is the only preparation which is a good one; and proper directions for it may be ſeen in the London Diſpenſatory. The Garlic, like Muſtard, will act as an external ſtimulus, and, except from its diſagreeable odour, anſwers equally, and may likewiſe be very properly applied to the extremities in low fever. The Garlic is not ſo liable to ulcerate the part, but is more apt to be abſorbed and to extend its effects to diſtant parts. Some ſay, that this is pectoral externally applied, but I have never been able to obſerve this effect.

As to any difference in the *Alliaciæ*, it is only a difference in impregnation and ſtrength. The *Allium*, *Cepa*, and *Porrum*, are placed in the order of their virtues, the *Allium*, the ſtrongeſt, *&c.* A peculiar virtue has been attributed to the *Porrum*, *viz.* a narcotic quality. This quality, however, is doubtful: I know one or two inſtances which ſeem to favour it, but I have alſo known it given in conſiderable quantity without that effect.

Oppoſite to *e* is inſerted the title,

5. CONI-

5. CONIFERÆ.

The virtues of these are manifestly as much a-kin as their botanical qualities, I mean of those here set down; for it is not known, whether we can extend the analogy to other plants or trees of this order. The *Taxus, e. g.* is suspected of a poisonous quality, which indeed I shall not determine if it possesses; but certainly it must be granted, it is more acrid than the rest. All the three of this order set down, the Fir, the Pine, and the Juniper, possess that peculiar acrimony, which is called, by Floyer, the Terebinthinate; and indeed their virtue seems to depend on a Turpentine. There seem to be some exceptions, but either in medical or chemical qualities there is little difference, except in odour. They all afford the same essential oil as is extracted from Turpentine. It is on this account that I have set down that substance, and others which are a-kin to it, under my next title, which should be placed at *f*, *viz.*

6. BALSAMICA.

The title of Balsam has been applied to oily or resinous bodies of a middle consistence, betwixt oil and resin. These are commonly obtained from the *Coniferæ*, and all approach to the nature of our Turpentine. Of Turpentine, and the four Balsams that follow, I am apt to think the virtues very much in common, and nearly the same in all. All have manifestly the power of stimulating the intestines, whether thrown in by injection into the *anus*, or swallowed by the mouth. Hence the Peruvian Balsam has been recommended in that dry belly-ach, which is called the *Colica Pictonum*. We know the daily use of Turpentine in clysters, and, indeed, in my opinion, it is one of the best substances we use for that purpose. Wherever there is an obstinate costiveness, Turpentine answers much better than saline matters; not that it is a stronger stimulus, but that it is more durable, and more certain, remaining longer than the salts, which are soon thrown out, from their stimulus. The Turpentine, too, is much better than acrid purgatives, which often increase the disease. This

effect

effect is not peculiar to the Turpentine, but alſo exiſts in greater perfection in the *Balſam Copaibæ*. Guiac, too, has been uſed as a purgative, and I make no doubt but the Balſams of Gilead and Tolu would act in the ſame manner. All carried farther, ſeemingly into the maſs of blood, are diuretic, diaphoretic, and pectoral, perhaps on the ordinary footing of ſtimulating excretions, which have ſo much in common. More eſpecially do we obſerve their diuretic effects, in ſo far as we can perceive them paſſing off in ſubſtance, by the urinary excretion. Turpentine, and the other Balſams, give what is called a violet odour to the urine; but ſeveral times have I found it the ſame as that of Turpentine itſelf. Fuller tells us, that *Balſam Copaibæ* gives a bitterneſs to the urine; but on having this tried, I did not find any ſuch effect, but juſt the ſame as is given by other Balſams.

All theſe ſubſtances contain ſomewhat ſaline, reſembling much ſuch an acid ſubſtance as is got from Benzoine. Such a ſaline matter I have ſeen concreted in Turpentine, which ſome have ſaid they extracted by itſelf, and the ſame thing is obſervable in Peruvian Balſam. Poſſibly their diuretic virtues may depend upon this Salt, and all of them contain an acid of the ſame kind. Conſtantly, by *Materia Medica* writers, have they been recommended in the *Nephritis*, but the propriety of the exhibition here is very doubtful; as theſe caſes are generally attended with an inflammation, which would be rendered worſe by *ſtimuli*. Surely if ſand is impacted in the *tubuli uriniferi*, or ureters, we muſt uſe antiſpaſmodics and relaxants; for in ſuch caſes the uſe of *ſtimuli* would be very dangerous. If it be confirmed, that the *Uva Urſi*, and other aſtringents, have ſuch good effects in diſeaſes of the kidneys, we may very ſafely ſay with Ovid,

Parce, puer, ſtimulis, & fortius utere loris.

I myſelf have ſeen the bad effects of Stimulants in ſuch caſes, in producing inflammation in the neck of the bladder. Theſe Balſams have been conſtantly ſuppoſed of a drying power, and recommended

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in gleets; and as they affect the urinary paſſages, in what is contiguous to them, the uterine. They have alſo been recommended in *fluor albus*. Their effects in ſuch caſes are confirmed by experience. It is difficult to explain how they act. They do not act by their aſtringency; for they poſſeſs no ſuch property. They are ſaid to have an agglutinant quality, and from this is their operation explained in wounds, and ulcers. Even in ſuch caſe they do not act from ſuch pretended quality; and although it ſhould be granted they did, yet we can never ſuppoſe they act in the ſame manner in the urinary paſſages; nay, the ſame virtue reſides in the oil, and other Stimulants have the ſame effect. I have ſeen *Cantharides* cure both the *fluor albus* and gleet, and nothing but its very acrid qualities, and the uncertainty of its action upon different people, hinders, in ſuch caſes, its more frequent uſe. From this view, I think there is no ſort of doubt, but that our Balſams act in ſuch caſes, by bringing an inflammation on the lax veſſels, inducing in them contraction and firmneſs. Several accidents tend to illuſtrate the ſame theory. I have ſeen perſons cured of an obſtinate gleet by long journeys, and riding poſt, *&c.* Injections of Calomel I have ſeen given in ſuch quantity as to produce an inflammation, which it was neceſſary to calm by repeated bleedings, have the ſame good conſequence. Corroſive Sublimate I have ſeen produce bloody urine, but at the ſame time cure the patient; and ſomething alſo of the ſame kind I have ſeen occur from *Balſ. Copaibæ*. All this ought to make us cautious in the uſe of thoſe medicines; as it is very difficult to meaſure the inflammation, and proportion the doſe to what degree of it we would produce.

As to the pectoral virtue of the Balſams we are ſpeaking of, it muſt be admitted on the ſame footing as that of other Stimulants. In ſome aſthmas without fever, where the excretion of mucus is ſtopped by ſpaſmodic affections, our Balſams may promote that excretion by their antiſpaſmodic virtue. Their uſe muſt not be promiſcuous. Theſe, and the Balſams of Sulphur, were formerly employed in all diſeaſes of the breaſt, and even in ulceration of the

lungs, but as producing that inflammation, which is in such a case so dangerous, they are now in such intention properly laid aside.

With regard to the diaphoretic virtue, they have it in so far as they are diuretic; but though they are diaphoretic by stimulating the excretions, yet they also seem to be so by acting on the stomach. I have seen Guaiacum exert this property before it entered the intestines; and Oil of Turpentine before exerting its diuretic quality, which, however, afterwards it did. The diaphoretic virtue of these Balsams seems the foundation of their use in the Sciatica, in which disease Pitcairn gave Oil of Turpentine, in doses of * ʒiv. or ʒij. with success. For my part, I never could come up to this dose; from the heat and uneasiness produced in the stomach. Sometimes, however, even in the small doses in which I could exhibit it, I have seen good effects in Lumbagos and Sciaticas; but as often have I given it without any relief, and have sometimes seen inflammation occasioned by it. On the same footing is the use of Guaiacum in the Rheumatism, in which it is supposed specific. In the *Angina*, where there is no inflammation, it may be useful by promoting the diaphoresis; but in the case of inflammation, it always does harm, and I have often in such cases seen the effects of it very difficult to remove. In several chronic rheumatisms it is useful. In gouty cases, in so far as it stimulates the stomach, it may be useful; as every medicine in that disease will, which stimulates only to that degree, as to strengthen. Guaiac, too, is said to prevent the Gout in the extremities. How far that ought to be done by this, or any other medicine, shall afterwards be mentioned.

These are the common virtues of our Balsams. They have virtues depending on their essential oil, which, perhaps, in proportion to the quantity they contain of that, they will exert more powerfully. Thus the *Balsam. Copaibæ* has much more oil in its composi-

* In another copy the doses expressed are from one to two drachms, which seem to be nearer the truth.

tion,

tion, and is more powerful than the Turpentine. The others in this reſpect are not examined. Odour, too, may be ſuppoſed to vary the virtues of theſe Balſams; but a very great odour may reſide in a very ſmall quantity of matter. Whatever, then, may be ſaid of the *Balſ. Gileadenſe* in the eaſtern countries, I do not know, as upon proper trial I have not examined its virtues; but, *à priori*, I ſhould expect little from it. I ſhould much rather prefer thoſe which are cheaper, and leſs apt to be adulterated.

All theſe Balſams are apt to ſtay long upon the ſtomach, and I have known Turpentine continue there for ſeveral days in ſome caſes, with troubleſome ſymptoms. In whatever manner they are divided, whether by yolk of egg, or more elegantly by mucilage, they are ſoon collected, and reſiſt the power of the ſtomach. Hence I imagine, we ſhould get a better medicine by applying ſpirituous menſtrua to Fir-tops, *&c.* than by giving the Balſams themſelves. Of Fir, the Leaves and Tops may be employed, and Berries of the Juniper are in common uſe. Whether we obtain a ſufficient impregnation, I ſhall not determine; but certain it is, that I have ſeen Juniper tea cure gleets, equally well as the *Balſ. Copaibæ*. Theſe grow in greateſt perfection in the warm climates; and in Holland, where they are much uſed, they get them from Italy. If ſuch could be got, they would certainly anſwer. Geoffroy relates that they produce bloody urine, which gives a caution in their exhibition even in their mildeſt ſtate. Hoffman gives a great character to the reſiduum, remaining after the infuſion of Juniper Berries, for ſtrengthening the tone of the viſcera, and of the ſtomach in particular. He ſpeaks of it as aſtringent. I have, on trial, neither found the aſtringency, nor the effects he mentions. The ſubſtance was rather of a ſweetiſh nature.

The Guaiac anſwers as well as any of theſe Balſams, and is of more convenient exhibition. Perhaps the friable Balſam of Tolu would have the ſame advantages, but hitherto it has not been employed.

Next the Balſams mentioned, ſtand

MYRRH and LIQUID STORAX.

Of Liquid Storax I am uncertain what to ſay. Whether there be ſuch a vegetable exſudation as this is ſaid to be, I am doubtful. Certainly what we have in the ſhops under this title, is an artificial ſubſtance; and Hoffman relates his knowing a man in Berlin, who manufactured it in conſiderable quantity. Its ſenſible qualities give us no reaſon to make any preference of it to the others.

With regard to the Myrrh, it has been of long and frequent uſe, but by no means are its peculiar virtues aſcertained. It has been commonly, but improperly joined with the fœtid gums; for it differs from them in its ſenſible qualities. In its taſte it is reſinous, and of an oily nature; it comes nearer to our Balſams, and it is on this account that I have placed it among them. It is acrid in the *primæ viæ*, ſtimulates the inteſtines, and, as joined to Aloes, may increaſe its purgative virtue. I was preſent at ſome experiments intended to aſcertain the virtues of this medicine. In the doſe of ʒſs. it heated the ſtomach, produced ſweat, and agreed with the Balſams in affecting the urinary paſſages. As commonly joined with the fœtid gums, it has been ſuppoſed to promote the menſtrual flux; but this virtue is only in common to it with other Stimulants. It does not, as the Aloes, *&c.* act by rarifying the blood.

Oppoſite to *g* ſtands the term

LIGNA, WOODS.

Although I have uſed this common term, it is not from any relation. It is ſometimes very difficult to ſay to what claſs medicines are to be determined. I have ſet theſe here together, as commonly uſed in the ſame preſcriptions.

GUAI-

GUAIACUM.

This wood certainly contains in its ſubſtance all the virtues of the Gum, but then this cannot be extracted from it, but by a ſpirituous menſtruum. Its ſhare in the *Tinct. Sennæ compoſita* is recommended by Dr. Lewis as a conſiderable improvement to that medicine. He ſays, that ʒij. of Senna, infuſed in ℥viij. of Decoction of Guaiacum, will work as briſkly as ʒiij. in plain water. The fact is certainly true, but it is owing merely to the largeneſs of the menſtruum; and I have known two pounds of Decoction of Guaiacum given without purgative quality. I ſay it is owing merely to the largeneſs of the menſtruum. For ʒij. of Senna, infuſed in ℥viij. of water, will have equal effect with ʒiij. in ℥iv. The Decoction of the Woods is a medicine of little efficacy, and, I imagine, wholly inſignificant. The virtues of the Woods reſide in an eſſential oil, which cannot be extracted with little boiling, or a ſmall quantity of menſtruum. If the coction and the menſtruum are increaſed, the eſſential oil is diſſipated as much as the quantity extracted is enlarged. In ſhort, during a practice of thirty years, I have never ſeen one cure performed by it, ſo that it does not matter whether we allow the impregnation or not. It has been reckoned ſpecific in venereal caſes, but it is only efficacious in theſe in ſo far as joined with a ſweating and emaciating courſe; by which means the fluids are changed, eſpecially that in which Boerhaave ſuppoſes the venereal poiſon to reſide, the oil of the body. Although I do not entirely agree with Dr. Boerhaave in this notion, yet I am convinced that the emaciating courſe is what in this caſe has the ſole effect, and the *Decoctum Bardanæ* will anſwer equally well with that of Guaiacum.

SASSAFRAS.

This is commonly joined with the Guaiacum, and is, for that reaſon, placed here, though a ſubſtance of very different ſenſible qualities, and inſtead of a thin eſſential oil, affords one of the greateſt ſpecific gravity we know. As differing, then, in its ſenſible qualities,

lities, and likewiſe in claſs, we muſt ſuppoſe it a different medicine. With regard to its uſe, we make this obſervation, that wherever we loſe ſight of Stimulants promoting a certain evacuation, we muſt be very doubtful as to their effects; nay, ſtimulating the ſyſtem in general may have very bad conſequences. There is no doubt of Saſſafras being a Sudorific, and to this I confine its virtue.

SANTALUM, SAUNDERS.

This Wood is now hardly known in practice. It affords an oil like that of Saſſafras, which may be extracted by ſolution or diſtillation. I ſpeak this of the Yellow Saunders. It is, however, a ſubſtance of little uſe, and properly neglected in preſent practice.

The three ſubſtances which ſtand next to the Woods, have no proper relation or affinity with them; but becauſe they have been employed likewiſe in venereal caſes, they are ſet down along with them.

RADIX CHINÆ.

This formerly had ſome reputation in venereal caſes; but as I have hardly ever ſeen it in our ſhops poſſeſſed of any ſenſible qualities, I imagine it is with ſome reaſon that it is now baniſhed from practice. But let me obſerve, however, that it is of the ſame genus with the Sarſaparilla, which has little ſenſible qualities; ſo that if virtues are found to reſide in the one, it is probable they alſo exiſt in the other.

SARSAPARILLA.

This has little ſenſible qualities, and any that it has, are not obtained but by long coction; ſo that upon the ordinary method of reaſoning, it ought to be thrown out of practice. About twenty years ago it was reckoned inſignificant, but lately the Phyſician at Liſbon having done great ſervice in venereal caſes, by what is called the Liſbon Diet-drink, many conjectures were about its compoſition,

and,

and, among other things, it was ſuppoſed to be no other than a decoction of Sarſaparilla, and this came again into practice under the reputation of curing venereal caſes, in which Mercury failed. Fordyce, in the London Medical Eſſays, gives us ſeveral caſes, in which Sarſaparilla was of conſiderable ſervice. Whatever, then, we may object to the difficulty of finding an explanation for thoſe virtues, to its want of ſenſible qualities, *&c.* yet the caſes mentioned make me ſee foundation for the uſe of Sarſaparilla in practice. Fordyce condeſcends upon particular times of the diſeaſe. None of the caſes, in which Sarſaparilla cured, were recently venereal: It ſeemed neceſſary that Mercury ſhould have preceded its exhibition, and that in conſiderable quantity; ſo that its uſe ſeemed preferably confined to ſuch caſes as Mercury had failed in. We in this country know no proper *Lues*, and I have ſeen no caſe in which Mercury failed; but certainly there may be ſuch, ariſing either from miſmanagement, and perhaps the bad effects of the Mercury, or perhaps the inveteracy of the diſeaſe itſelf. Whatever is in this, Sarſaparilla is chiefly directed in pains of the bones, from ſuch circumſtances either ariſing from cold, *&c.* yet ſurely venereal. This I would take as a teſt of the efficacy of the Sarſaparilla, that in ſuch pains where the patient had not ſlept for a conſiderable time, the exhibition procured eaſe and reſt. If in ſuch caſes, after ſuch teſtimony as has been given, it fails, I would alledge, it was from the badneſs of the Sarſaparilla, or the inaccuracy in preparing it. I think that the firſt caſe is very common, for I have never ſeen it with any ſenſible qualities; and in one caſe where it had, they were different from thoſe aſcribed to it by *Materia Medica* writers. I forgot to mention, that Sarſaparilla was recommended in cutaneous diſeaſes from a venereal cauſe. A very ſtrong impregnation and decoction of this plant is neceſſary. It becomes ſooner acid than any impregnation any other dry root affords.

CONTRAYERVA

Comes from a plant of ſome, though not conſiderable acrimony, with little, but peculiar odour. It may therefore be, as is ſuppoſed, diapho-

diaphoretic, or, as *Materia Medica* writers call it, alexipharmic. It is uſed in malignant, low, nervous Fevers, to ſupport the *vis vitæ*, and promote ſweat. With regard to the uſe of acrid medicines in Fevers, I find it very difficult to know when they ſhould be employed, nor can we do ſo till we have got a farther light into the theory of fevers. With regard to thoſe who conſider Fever merely as an encreaſed motion of the fluids, I cannot think when we ſhould uſe them, except we alſo take in ſomething, that during the whole is continually weakening the nervous power. I uſed to ſolve this difficulty, by alledging, that the medicines we employed were not really Stimulants, but Antiſpaſmodics. Moſt of them are ſo, but there may be caſes where ſimple Stimulants are uſeful; but of this afterwards in a more proper place. At any rate I imagine, that from the manner and quantity, (*viz.* three grains,) in which we exhibit *Contrayerva*, that it is only a part of our rotin, and poſſeſſes no virtue at all. Of late Dr. Pringle has introduced a new conſideration in Fevers, the exhibition of Antiſeptics. I will not deny that theſe may do good, but in the quantity we exhibit them, (*Contrayerva*, *e. g.*) their effect is extremely doubtful.

The medicines we have been now talking of were claſſed according to the botanical analogy, and, properly ſpeaking, were introduced by the *Coniferæ*. We now come to medicines claſſed from the analogy of the ſenſible qualities. Oppoſite to *h* is placed the title,

AROMATICA FRAGRANTIORA.

Such medicines are termed aromatic, as join with a pungent acrid taſte a fragrant odour of the agreeable kind. They all abound in an eſſential oil, which in the proper aromatics is ſpecifically heavier than water, and are generally natives of the Torrid Zone. The whole of our liſt do not exactly agree in theſe characters, but are ſome of them ſet down for the ſameneſs of their eſſential oil, &c. They are diſtributed into *faſciculi*. The firſt ſix are beſt entitled to the appellation in every view. All of them have qualities very much in common;

mon; they ſtimulate the ſtomach, aſſiſt digeſtion, and increaſe appetite; in a ſtronger degree take off ſpaſms in the *primæ viæ*, by maintaining the ſtronger action of the ſtomach; take off ſpaſms ariſing from vegetable aliment, and, in general, except in inflammatory caſes, are uſeful in all ſpaſmodic affections of the alimentary canal. However, they ſeem rather appropriated for relieving thoſe ſpaſms when they occur, than to obviate them. Nothing is more common than to give aromatics with purgatives, which are liable to produce ſpaſms; but in obtaining the pretended effect of their obviating ſuch, I have been frequently diſappointed. On other occaſions, Aromatics are uſed in all cold diſeaſes of the head and brain, in all languors of the ſyſtem, and, in ſhort, for all the purpoſes of Stimulants. All of them are of an inflammatory nature, having their virtue depending on an eſſential oil, and apt to inflame the part to which they are applied. Thoſe Aromatics are moſt ſo which have this oil in greateſt quantity, and of the moſt acrid kind.

They have been employed in the caſe of Intermittent Fevers, in order to obviate the return of the fit, but by this practice we are always liable to change an Intermittent into a Continued Fever. Many Intermittents are of an inflammatory nature, eſpecially thoſe of the ſpring ſeaſon; and in theſe eſpecially would aromatics be improper. Theſe are the virtues of Aromatics in general, and are applicable to each.

Though diſtributed into *faſciculi*, I do not well know how to diſtinguiſh them. The firſt ſix are the moſt proper Aromatics, moſt agreeable, and moſt uſed in food. The *Canella alba*, *Cortex Winteranus*, and *Ginger*, are of inferior degree of fragrancy, but ſtill are entitled to be ranked with the others. The *Pepper* and *Capſicum* have little odour, but moſt poignancy of taſte, and are the moſt powerful; which is an evidence of the ſmall efficacy of odour in giving virtue; and from the want of odour they are more recommended in food in certain circumſtances. The eſſential oil extracted from theſe, is milder than their ſubſtance; which ſhows, we ſhould

not always ſuppoſe we have extracted all the virtues, where we have extracted the eſſential oil, for often that is ſo heavy as not to riſe. Alcohol, in ſuch caſes, affords the beſt impregnation. Pepper, like Muſtard, can be taken in ſix times the quantity when whole as in powder, without producing the ſame heat. In Intermittents, where Pepper is commended, this is the proper method of exhibition; for by this means the ſtomach cannot extract ſuch a conſiderable quantity at a time as to produce inflammation.

The next three have not an odour of the fragrant kind, and therefore are not uſed in food. They have no other virtues but thoſe of the foregoing, and might be ſafely rejected, were it not to afford that variety which is ſometimes required to adapt Stimulants to particular taſtes.

The next three ſubſtances ought to be ſeparated from this claſs; for though poſſeſſed of an acrid taſte, they have a diſagreeable odour, and may be of different virtues.

Galangals were introduced when we were in the humour of introducing every other medicine. It is neither agreeable in odour nor taſte, and is the weakeſt of the claſs, and therefore now properly rejected.

Zedoary has a penetrating odour, like that of Camphire, and is ſaid to afford a concrete of much the ſame nature, and therefore probably has antiſpaſmodic virtues, which, however, are not yet aſcertained.

Serpentaria Virginiana. This contains an acrid eſſential oil, and therefore is poſſeſſed of the virtues of the Aromatics. Its odour approaches nearly to that of Valerian. Perhaps it is too frequently preſcribed in the Edinburgh Diſpenſatory. Surely as an Aromatic it is leſs agreeable than many of the others. It is ſuppoſed of peculiar virtues. It is almoſt the only Aromatic we uſe in continual Fevers,

Fevers, and I have ſeen it of good effect in low nervous Fevers, raiſing the pulſe, diminiſhing its frequency, and bringing the Fever to a happy iſſue. It is certainly preferable to the *Contrayerva*. We call thoſe Fevers low and nervous, in which there is always a languor of the *vis vitæ*, and of the nervous power. When this proceeds to a higher degree, and is accompanied with putrefaction, we call the Fever malignant. In the laſt caſe, in the malignant Fevers, the *Serpentaria* is often evidently uſeful, and in the beginning of nervous Fevers, where there is no manifeſt putrefaction, it is often of pernicious conſequence. Dr. Pringle has been very attentive to malignant Fevers, and deſerves great praiſe for his obſervations on them, though ſometimes he is apt to ſuppoſe their exiſtence oftner than it really is. From his notion of antiſeptics he was led to exhibit the *Serpentaria*. But he himſelf gives us a caution, though prejudiced in its favour, *viz.* that he was now obliged to diminiſh his doſe, from the heating effects of this medicine. Theſe heating effects are not ſometimes to be meaſured by the temperature of the ſkin, but the frequency of the pulſe. Though I have often ſeen good effects from this medicine, yet, as they are always very doubtful, as malignancy ſeldom occurs here, and as I can obtain its good effects from medicines of a leſs inflammatory nature, and which I can exhibit with greater ſafety, I have now laid it entirely aſide.

Of the five next following, the *Malabathrum* and the two *Nardi* are now entirely neglected. The others manifeſtly contain ſomewhat of aromatic virtue, but ſo weakly, that they have neither deſerved nor obtained reputation. Thoſe of them whoſe flowers we uſe, always loſe their virtue before they come here. Nay, even thoſe which are reared in this country, the *Balſamita*, *e. g.* and *Coſtus*, have no peculiar virtue.

Lilium Convallium. This is an inſtance of odour introducing a ſubſtance into medicine improperly. Though agreeable and fragrant, yet it is an acrid, even poiſonous ſubſtance, and, as having no virtues depending on its odour, carefully to be avoided.

Ginſeng. This, like other ſubſtances which have come into common uſe, has had great virtues aſcribed to it, eſpecially in the countries where it is in common uſe. It is a mild Aromatic, and, to thoſe who require ſuch amuſement, a ſafe maſticatory. It may be of uſe, but the weakneſs of its ſenſible qualities give it no foundation for a place in medicine. The engaging virtue of a powerful incentive and aphrodiſiac has been attributed to it, but on the moſt ſlender, and, indeed, abſolutely falſe foundation.

Caſcarilla. In this country, and indeed England, this is little known as a medicine, but much uſed in Germany, and other countries. Its hiſtory is related by Geoffroy, and tranſcribed by Dr. Lewis, neither fully, nor accurately. In Germany its reputation is fallen of late, and its virtues are diſputed. This with me, as with many others, has prevented any trials with regard to it. It belongs to a ſet of plants, which contain an acrid and ſomewhat of a poiſonous nature. Its oil is very inflammatory, and as ſo irritating and heating the ſyſtem, and promoting ſweat. In ſome caſes it may be uſeful; in thoſe, *e. g.* in which the Germans recommend it. It has ſomewhat of a narcotic power, and as a bark manifeſtly aſtringent. G. Alpinus employed it in malignant Fevers. Juncker ſays that it does not anſwer in preſent practice; but that may often happen, from our not knowing the caſes to which it is appropriated. Juncker and Stahl recommend it in Intermittents, but there it is by no means equal to *Peruvian Bark*, which Stahl, from his ſyſtem, avoided. From its aſtringent and narcotic qualities, it might have been uſeful in thoſe caſes, in which the French Phyſicians employed it, and its other ſenſible qualities will explain its uſe in other caſes. Stahl recommends it in Peripneumony, and Diſeaſes of the Breaſt. He excepts the *Angina*, which makes me very doubtful about its uſe in the other caſes.

Aſpalathus and *Rhodium.* Had I intended to ſwell out my Lectures, I might have ſpoken of the various appellations of *Aſpalathus*, &c. but on ſuch diſquiſitions I have nothing new to ſay. I avoid uſe-

leſs

leſs and unintereſting ſubjects. They have a fragrant, agreeable odour, on which no virtues ſeem to depend, and the only one attributed to theſe woods is that of cordial. They ſeem, then, to be very properly neglected, and more to be regarded by the Perfumer than the Phyſician.

The three following Gums could not have been ranked with any we know, except with the *Balſamica* before mentioned, to which they ſeem to be akin.

Benzoin and *Storax* are remarkable for giving out a ſaline ſubſtance, of the acid kind, in a dry form, under the name of flowers. Theſe volatile ſaline acids are certainly found in the Balſams, and no where elſe that I know. The Balſam of Peru is ſaid to give out ſuch in conſiderable quantity, and I myſelf have ſeen it concreted in turpentine. This ſaline ſubſtance in our Gums, is joined with a reſinous matter of remarkable acrimony. To both the Flowers and Gum have been attributed the ſame virtues, which makes me, indeed, very uncertain about them, as it is what I cannot poſſibly imagine. They are ſaid to be pectoral. I have ſeen them exhibited without ſhewing any antiſpaſmodic power, or promoting expectoration. In general, we ought to be very cautious in exhibiting ſtimulant Pectorals. Being not employed in preſent practice, though not a proof of poſſeſſing, may yet be one of our knowing no virtues in the Storax or Benzoin. Although they had virtues, they could ſcarcely appear in the doſe employed. The *maximum* of *Materia Medica* writers is ten grains. I have ſeen them given in twice the quantity without any effect at all.

I cannot ſay that *Labdanum* is placed very properly between the two foregoing. It is employed in plaiſters, and, with the other warm Gums, may have its ſhare in ſtimulating.

We now come to a ſet of Medicines, whoſe titles ſtand oppoſite to *i*, which are very commonly employed, but whoſe effects on the ſyſtem are very difficult to explain.

9. AMA-

9. AMARA.

This term is to be considered as very general, and running through a great part of the *Materia Medica*. The *Amara*, however, are seldom simple, but combined with other qualities, as stypticity, acrimony, aroma, *&c.* When I speak of Bitter, I mean pure and simple Bitter, as that occurring in Gentian, Bile, *&c.* In my list, I have not exactly confined myself to this; but considered as bitter those medicines in which that quality is chiefly prevalent. With regard to all these plants, a certain degree of stimulus is to be perceived in them, depending on an essential oil, in greater or smaller quantity, giving distinction to the Bitter. But this essential oil, as some have imagined, is not that part in which the Bitterness resides; for on drawing that off, the Bitterness remains in its full force, only more pure. It must be confessed, however, that in some particulars the Bitterness does seem to reside in the essential oil. More or less of Stypticity is commonly joined with Bitterness, and cannot be separated from it, though discoverable by striking black with a solution of Green Vitriol. It is commonly said, that Bitters give more fixed alkali than other plants, and from a variety of trials I believe the fact to be true. What is to be inferred from this is very uncertain. The chemists imagine they contain this, in the mixt, in the same state; but in this they are mistaken; and though Bitters check fermentation, it is very far from being in the same manner as an alkali, which acts by destroying an acid.

The common VIRTUES of BITTERS are these:

All are more or less stimulating and strengthening, hence are supposed to promote appetite, and assist digestion. In the *Stomach* they check fermentations of all kinds, on the one hand preventing a noxious acid, and on the other resisting putrefaction. It is very probable, that their assisting digestion depends as much on this resisting putrefaction, as on their stimulant quality; for many substances which contain more stimulus, are without that effect. Many Bitters excite vomiting,

vomiting, but without any emetic power, as has been ſuppoſed. Univerſally they are nauſeous; and, when taken in warm water, expede, rather than promote vomiting. The proof is this, that if a ſlight impregnation be equally nauſeous, it will be as effectual as a ſtrong one; and that given in powder, ſo as to paſs the fauces without being taſted, they have no ſuch property.

In the *Inteſtines* their ſtimulant virtue is better founded. Their taſte reſembles the bile of animals, and ſeemingly in the ſame manner as that does, they ſeem to promote the periſtaltic motion. In trying Chamæmile for the curing Intermittents, I have given it in the doſe of ℥j. without any proper purgative quality; though I muſt own, in ſuch quantity it commonly moves the belly. In the inteſtines we muſt mention their anthelmintic quality. All animals ſeem to ſhew an averſion to the Bitters, and there are inſtances of inſects avoiding their odour, which poſſibly may be the caſe with worms; and undoubtedly if theſe creatures ſwallow them they may be deſtroyed, as Bitters are poſſeſſed of a poiſonous quality. But we now know, that anthelmintic bitters are of very little efficacy, and Phyſicians ſuppoſe they act by ſtrengthening the tone of the inteſtines, and ſhaking off the mucus, in which the eggs of the inſects are contained. This, however, cannot be proved.

In the *maſs of blood.* I have ſeen Bitters paſs off by urine, in ſome caſes giving colour and ſmell to it, and at leaſt changing its condition. Bitters have been recommended in the Jaundice. The virtues, as we have formerly ſaid of all medicines recommended in this diſeaſe, are much to be ſuſpected. I muſt now own, that after the uſe of Bitters, when the urine flowed yellow, its conſiſtence and condition was changed. As promoting urine, they have been uſed in Dropſies. By themſelves, their effects here are not very remarkable, but are promoted by union with alkaline ſalts. Theſe two medicines ſeem mutually to increaſe each other's powers. Bitters are ſaid to be diaphoretic and ſudorific; and actually, in large doſes, and under proper regimen, they will excite ſweat as ſoon as

any

any medicine I know. Whether this virtue is to be imputed to their action on the ſkin, or on the ſtomach, is dubious. From the ſuddenneſs of their effect, the latter is the more probable caſe. In conſequence of their diaphoretic virtue, they are recommended as alexipharmics in Fevers, in which caſes they may be given with more ſafety than the Stimulants formerly mentioned, or the *Serpentaria*. In conſequence of their alexipharmic virtue, they have been ſuppoſed Deobſtruents in the whole of the ſyſtem, and uſed in rheumatic affections. They have been ſuppoſed, too, as Stimulants, to promote the hæmorrhoidal flux, and that of the menſes. Aloes has been alledged as an inſtance of Bitters promoting thoſe fluxes, but in that the Bitter is joined with a ſubtile purgative quality. In hæmorrhoidal caſes, in great quantity, they may be of ſome ſervice; in the ordinary quantity we employ them for the menſes, they are of none. As ſtrengthening the ſyſtem, they have been uſed in the cure of Intermittents. They certainly will cure; but, after repeated trials, I have found them not near ſo powerful as the Bark.

They have alſo been employed in continued Fevers, but the particular caſes in which they are proper, are difficult to determine. They have been ſuppoſed to remove obſtructions in the abdominal viſcera, and have been called Hepatics and Splenetics. Their ſpecific property I cannot conceive. They may be uſeful in Obſtructions of the Liver and Spleen, as in thoſe of the other abdominal viſcera, and therefore may be employed in cachectical caſes. In ſcrophulous caſes, if the Peruvian Bark be found of advantage, we may infer the analogy to other Bitters. Bitters have been ſuppoſed to cure the *Gout*, and in one ſhape they really do ſo.

Not long ago, in England, the Duke of Portland's Powder came into great reputation. It is compoſed of the *Ariſtolochia*, and four other Bitters; for I conſider the *Ariſtolochia* as a Bitter; though from its fœtid odour it be transferred to another claſs. This powder, in the Duke of Portland himſelf, and in many others who uſed

uſed it, prevented the painful return of the Gout in Inflammation of the extremities, and thus ſeemed to cure the diſeaſe; but almoſt always with a conſiderable change in the ſyſtem, and pernicious conſequences. I may venture to ſay, that ninety of an hundred, who have taken this remedy, in a year or two after have been carried off by apoplexy, *&c.* or ſome other mortal diſeaſe. In Scotland only twelve or fourteen perſons have taken this powder, and all have done it with the conſequences I mention. The courſe of the medicine muſt be continued for two years to produce the cure propoſed. Many have not had patience to go through this courſe, and therefore with them the medicine has neither had the effect of curing the Gout, nor of bringing on any other diſeaſe. All this I mention from my own knowledge. For the hiſtory, *&c.* of this medicine, you may look into a paper of Dr. Clephane, in the London Eſſays, where he ſhews us it has been mentioned by every practical Phyſician, ſince the time of Galen. Some alterations, at different times, have been made in the preſcription; but ſuch as allow it always to be conſidered as a bitter medicine. At the ſame time that Authors recommend it, they have always ſubjoined a caution as to its uſe. Upon its reputation in England, trial was made of it; and Gaubius gives teſtimony of its having the ſame effects we have ſaid. Such is the ſtate of the facts with regard to this uſe of Bitters. How they act in either caſe, we ſhall not take upon us abſolutely to determine. This may throw ſome light upon any method, which may be taken to explain it. We have ſaid that Stimulants deſtroy the tone of the ſtomach. Boerhaave, in a work, which, as ſpurious, I ſhould not quote, were I not certain of the fact alledged, in his Prælections on the *Materia Medica*, tells us, that *Ariſtolochia* deſtroys the tone of the ſtomach, ſmooths the inner ſide of the ſtomach, and takes off its villous coat. From all this we ſee how ſparing ought to be the uſe of Bitters in ſtomach complaints. But as the Gout ſeems to be ſent to the extremities, by the tone of the ſtomach, we in ſome meaſure conceive how Bitters act in preventing the appearance in the extremities. Whether it is from the

arthritic effort, if I may ſo ſpeak, that the diſeaſe is thrown upon the brain, I ſhall not determine.

Having mentioned the arthritic, we ſhall here ſpeak of the antinephritic virtues imputed to Bitters, where they are ſuppoſed to act as diuretics. As this effect of being diuretic is not conſiderable, and as they are not ſuppoſed to change the figure, *&c.* of the ſtones in the kidneys, from analogy we may infer, that their action is much in the ſame way with ſome medicines mentioned for the ſtone. There is a ſimilarity between arthritic and nephritic caſes. It is commonly ſuppoſed that the nephritic fit is owing to the ſize, weight, roughneſs, *&c.* of the ſtone in the kidneys. When a perſon is ſeized with the Gout, he is relieved from the ſymptoms enſuing from ſuch ſuppoſed cauſes; though how an inflammation can take off the ſize, *&c.* of a ſtone in the kidneys, is to me impoſſible to imagine. We muſt then ſuppoſe, that the affection of the kidneys is the cauſe of concretion of the ſtone, and not the latter of the former; in the ſame manner as Gout cauſes concretions of chalk, ſo the Gout, from taking off this affection of the kidneys, relieves the ſymptoms conſequent upon it. This will be underſtood from what we have ſaid on the *Uva Urſi*. I cannot help mentioning a remarkable inſtance, where the ſtone in the kidneys remained, and yet the patient was relieved from nephritic complaints by the attack of a gouty paroxyſm. A Gentleman, from nephritic complaints was ſeized with exceſſive ſtrangury, fœtid purulent urine, and ulcers in the whole track of the urinary paſſages, hectic paroxyſms, *&c.* inſomuch that it was thought his caſe was deſperate, when being unexpectedly ſeized with the Gout, he was relieved from theſe complaints; his urine became leſs fœtid, freer, *&c.* and, for a fortnight, during which the Gout laſted, enjoyed an interval of eaſe from his nephritic pains. Nothing more clearly than this ſhews the connexion between the *Arthritis* and *Nephritis*.

I knew another perſon, who being troubled with the Gout, was ſeized with a *Nephritis*, upon whoſe encreaſe the Gout was proportionably

tionably diminiſhed. Upon diſſection, no ſtone was found in the kidneys. This caſe ſeems peculiarly to have been adapted to the *Uva Urſi*.

We have commonly been in uſe to neglect the antinephritic powers of Bitters; yet certainly, although we know their bad effects in the Gout, yet in nephritic caſes they may have ſtill enough to be worth enquiring into. Upon the whole, we ſee the intimate connection between the two diſeaſes, which poſſibly alſo may extend to their remedies; and certainly it would be equally ridiculous to reject their power upon the kidney, as to admit of their action on the ſtone.

Bitters are alledged to have ſomewhat of a narcotic quality, eſpecially applicable to thoſe which abound in eſſential oil. So far as it is diſcovered in Wormwood, it depends on the peculiarity of its eſſential oil, and not on its Bitterneſs. Opium is a Bitter, but it would be fooliſh to ſay its narcotic qualities depended upon this. I chuſe to mention this, as ſome deduce the bad conſequences of Bitters from it.

Bitters are ſaid to weaken the ſyſtem in general, and particularly the genital powers. Of the truth of this I cannot ſay. It is ſcarcely to be known but from a very diſagreeable experiment, an experiment on one's-ſelf. More certain am I of another bad effect imputed to them, *viz.* hurting the eyes. Thus, down from the times of the ancients, it has been obſerved, that Wormwood (and the ſame property may reſide in all) affects, like Sage, the eyes, with an uneaſy dryneſs, weakneſs, contraction, and inflammation, attended with head-ach. Theſe effects ſeem to depend on the narcotic quality, as the few which have them abound in eſſential oil.

PARTICULAR BITTERS.

I have only a few remarks to make upon theſe; I have diſtributed them into ſetts; that containing the firſt (*i*) belongs to a natural order, the

It is in the leaves of theſe that the Bitterneſs reſides; the root commonly contains an aromatic reſin, or, if it contains Bitter, it is of a weaker kind than that of the leaves. What I ſay upon the leaves does not apply to the *Semifloſculoſæ* or *Plano petalæ* which follow. Thoſe we are now treating of are called the *Amara calida*, the following the *Amara frigida*. *Abrotanum fœmina*, I have nothing to obſerve of it. It is weak in the virtues of its claſs, and neglected.

The four following are taking notice of as ſpecies of the ſame genus, and therefore as of kindred virtues. Phyſicians, however, have been chuſing, and diſputing about that choice. To me, the greateſt power of this genus ſeems to reſide in the *Abſynthium vulgare*, and there in the leaves. It contains a conſiderable quantity of eſſential oil, and is therefore chiefly noted for thoſe narcotic qualities we mentioned, and effects on the eyes. Its ſmell is rank and diſagreeable, but is loſt by keeping; that is, evaporation of the volatile part. Dr. Lewis ſays, that after diſtilling Wormwood for the ſimple water, that which remains in the ſtill, after the eſſential oil is gone, is a pure bitter ſubſtance, and gives a conſiderable impregnation to *alcohol*. I am doubtful whether this practice be right, either in this, or other caſes in which Lewis recommends it: At leaſt it remains to be enquired into, whether either the Bitter, or eſſential oil, when ſeparated, contain the virtues of the entire plant. The *Abſynthium* gives foundation for what I ſaid of the root of this claſs differing from the plant. Though I ſaid *Abſynthium* was the ſtrongeſt of this claſs, there may be others more ſtrongly aromatic; *e. g.* Haller mentions one which he found in Switzerland, which was uſed as an univerſal febrifuge by the inhabitants of the Alps. Of the *Artemiſia* we ſhall ſpeak afterwards.

Carduus benedictus contains a more pure Bitter, and leſs eſſential oil, and that very volatile. It may be extracted like Wormwood, but

but we find that heat applied diſſipates it, inſomuch that the only agreeable Bitter to be obtained from *Carduus benedictus*, is by infuſion in cold water.

The *Carlina* ſtands in our Diſpenſatories, but I am not acquainted with it. Authors tell us the root is bitter with acrimony, and conſiderably active.

Chamæmelum is the moſt frequently employed, and undoubtedly has almoſt all the virtues we have been talking of. It abounds in pungent aromatic oil, is conſidered as the moſt active of the Bitters, and, before invention of Peruvian Bark, was employed as a ſubſtitute for it. I have frequently tried it, and ſometimes with effect; but it falls much ſhort of the powers of the Cortex, and, when given in conſiderable quantity, is much more apt to run off by ſtool, and diſappoint our purpoſe. Simon Pauli relates, that a ſtrongly impregnated decoction of it in wine, comes at laſt to acquire a remarkably ſaline taſte, like that of common ſalt. Neuman confirms the ſame thing, and finds, that, like common ſalt, it makes Precipitates, but that they are different from thoſe obtained by it. Believing this might ariſe from the wine, Neuman boiled that in the ſame manner by itſelf, but without obtaining what he got from its impregnation with the Wormwood. *Lewenhoeck, in his Experiments, finds the ſame ſort of cryſtals, reſembling thoſe of common ſalt in *Carduus benedictus*, but unluckily did not try *Chamæmile*. This preparation ought to be enquired into. It may, perhaps, prove ſingularly diuretic, as is alledged.

Cotula fœtida, or *Wild Chamæmile*. Brown Langriſh gives an account of a decoction of this, recommended by a gipſey, throwing a perſon affected with a Rheumatiſm, into a profuſe ſweat, and curing him of the diſeaſe. Such inſtances ought to be marked.

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* Vide Philoſophical Tranſactions, No. 173.

Santonicum. This ſhould have been ranked with the Abſynthium, of which it is a genus. It is doubtful with regard to the nature of this ſubſtance, whether it be a ſeed at all; but although we ſee ſtalks, *&c.* evidently among it, yet, I think, as evidently we ſee ſeeds. As belonging to the Wormwood, I make no doubt of its having virtues, but ſurely it has none ſo peculiar as to make us import it. It has been thought anthelmintic, and hence its common name, Wormſeed. After many trials, I do not find its effects remarkable. Bitters undoubtedly may deſtroy worms, but, after many attempts, I have found no ſucceſs from their uſe. I blamed the ſmallneſs of the doſe, but in men, where it was much increaſed, no better conſequences followed.

Tanacetum. From Pringle's Experiments, all our Bitters are Antiſeptics. The Tanſy has a higher reputation of this kind, and, placed round animal bodies, is ſaid to preſerve them long from putrefaction. Tanſy has a larger proportion of Aroma, with its Bitter, than any of its claſs. Its Bitterneſs is more remarkable in the ſeed.

The three following ſubſtances are well known as medicines. Their virtues reſide in an eſſential oil. In the former, the Oil and Bitter were ſeparable, here the Oil contains both. On this account I conſider them as the moſt acrid and heating, and the bad effects we mentioned as reſulting from Bitters, moſt frequently appear in theſe.

Eſſence of Lemons is the moſt acrid of the three. They have all the common virtues of Bitters. Septalius gives a remarkable preparation of Orange-peel. He takes the *Peel of unripe oranges*, and, by long decoction, treats it as for an extract. This he gave with ſucceſs in a flow of the menſes.

Aurantia Curaſſavenſia. From their peculiar taſte, I take theſe to belong to the *Citrus*, which comprehends the Lemon and Orange. From their bitterneſs and ſize, I take them to be an unripe fruit, and therefore

therefore particularly fitted for Septalius's extract, whoſe effects I deſign to try; otherwiſe they ſeem properly introduced into our Diſpenſatory, as containing leſs of an eſſential oil, and ſo given with greater ſafety. Next to the three mentioned, ſtand

Centaurium minus & Gentiana. Theſe, in oppoſition to the others, contain a pure Bitter, with very little eſſential oil. They are ſpecies of the ſame genus. Gentian has been long known as a pure Bitter, and, as without odour, is more univerſally agreeable than any I know. Though not of much value, it has, from the great requeſt in which it is in ſome countries, been adulterated with a poiſonous plant. We ſeldom find it ſo here; ſo that I cannot give you the method of detecting it. As difficult, however, to get properly, Lewis, in the extract of Wormwood, *&c.* propoſes a ſubſtitute for it. We wonder he did not rather think of the Leſſer Centaury, a plant of the ſame genus, reſembling it in virtues and appearance. If we make choice of this, the leaves ſhould be employed which contain moſt Bitter, and more as they are nearer the roots. We certainly very improperly uſe the ſtalks and flowering tops. In a barren ſoil this plant is very ſmall. It is inconceivable to think, how much the luxuriancy of the plant is improved by tranſplantation to a fertile ſoil. Its Bitter alſo is improved by this change.

At the head of our next liſt ſtands *China Chinæ*, the famous

PERUVIAN BARK.

Chincona, Linnæus's name, is the only proper one, for this ſubſtance was brought to Europe by the Count of Chincon, after having remarkably cured his Lady; and hence all the other names, *China Chinæ*, &c. are only corruptions. When firſt introduced, it was found an effectual remedy in Intermittents; but whether it was that a medicine of more ſeeming efficacy was brought at the ſame time into Europe, or whether timid practice leſſened the doſe, it went

out

out of credit, and was not, till about thirty years after, reſtored by Talbot.

This is ſo much employed, that it would require a particular treatiſe. We ſhall not enter ſo fully upon it, but endeavour to give what is moſt important of it. Peruvian Bark belongs to the claſs of Bitters, and along with its Bitterneſs has an aromatic acrimony depending on an eſſential oil preſent. With this it has a ſtypticity or aſtringency, which ſome have thought proper to deny it; but which is evident ſufficiently, when by diſtillation or ſolution part of the other qualities are extracted.

All the common qualities of Bitters are aſcribed to the Bark. It has the ſame effects in the ſtomach and inteſtines. In a large quantity I have ſeen it purge; and I have known more than one inſtance of an habitual Coſtiveneſs cured by Peruvian Bark. It was not here given by accident. An habitual Coſtiveneſs often proceeds from a weakneſs in the alimentary canal, and in ſuch caſe, the Bark, given in the doſe of ʒj. for ſeveral days together, cured the diſeaſe, and ſeemed to work a conſiderable change in the ſyſtem.

Carried into the blood, little notice is taken of the diuretic or diaphoretic powers of the Bark. It is ſuppoſed to ſtrengthen the whole of the ſyſtem. Whether its action here depends on the proper exhibition, or on a ſpecific power, is diſputed. The laſt is commonly ſuppoſed, and the manner of operating as difficult, ſeems altogether neglected at preſent. I have formerly mentioned my averſion to ſpecifics. Many perhaps we may be ſtill obliged to leave among that number, but ſurely we ought to endeavour to leave as few as poſſible.

In order to cure an Intermittent, the Bark muſt be given in the interval of the paroxyſm, and it is univerſally agreed, that in the fever they are hurtful. Here it acts in preventing the return of the cold fit, and it is pretty generally agreed, that the cold fit is the

cauſe

cauſe of the diſeaſe. Thus Boerhaave, after telling us the order of the fits, tells us, *videtur is, qui primum tempus, & primam cauſam, ſuperare poſſit, etiam totum illum paroxyſmum poſſe tollere.*

The prevention of Intermittents depending, then, on the prevention of the cold fit, and the Bark acting on this, its method of action muſt be explained from the theory we form of the paroxyſm of Intermittents. If the cold fit be ſaid to depend on the accumulation of the fluids in the extreme veſſels, the Bark alters that accumulation; if on an affection of the moving fibres, the Bark obviates the return of the ſpaſmodic affection. One of theſe we muſt take up with. I agree with the laſt. At this time I will not enter into the diſcuſſion of that opinion, or the reaſons for aſſenting to it. On this ſubject you may conſult Van Swieten, Hoffman, *&c.* I ſhall give a hint or two upon it.

The paroxyſm of Intermittents ſeems ſo much an affection of the nervous power, that it is frequently induced and obviated by *animi pathemata.* All periodic affections are either of the ſpaſmodic or feveriſh kind. I own there may be ſome difference between theſe, but, from being the only diſtinctions, they may be ſuppoſed very much of the ſame nature. That neither *lentor*, nor a putrid *fomes*, as ſome have alledged, takes place, may be concluded hence, that all periodic affections may become habitual. It is a rule of Celſus, that when a perſon is cured of an Intermittent, he ought to avoid every thing which would cauſe a return of the paroxyſm, eſpecially on thoſe days in which the fit *uſed* to return. Now in this caſe, that perſon who thus (and it is frequently the caſe) is apt to have a recurrence of the paroxyſm, is commonly in good health, and cannot be ſuppoſed to be affected with a putrid *fomes.* It is my opinion, then, that the Bark acts by obviating the ſpaſmodic affection, to which the ſyſtem is ſo liable, and accordingly we find it a remarkable remedy in all affections of this kind.

We ſhould wiſh to go farther, and find this property connected with the ſenſible qualities of the Bark. The Bark is a Bitter, and

other Bitters have the ſame effect. I have ſeen inſtances, but not frequently, of Bitters curing Intermittents. That Bitters are not ſo powerful as the Bark, may ariſe from that being ſtronger, from their being joined with other qualities, from improper exhibition, or exhibition in too ſmall doſes. Thus Chamæmile flowers, ſuppoſed by Pitcairn equally ſpecific with the Bark, are much more liable to run off by ſtool; poſſibly, if joined with an opiate, that effect might be prevented. The Bark, then, being only a ſtronger Bitter, we muſt not confine the property of curing Intermittents to it, but extend it to other Bitters. All this, however, amounts to nothing more than a ſpecific quality of Bitters.

Let us view this matter in another light. Bark is ſenſibly an Aſtringent, and other Aſtringents have been uſed with ſucceſs in the ſame caſes; Alum, Steel, and vegetable Aſtringents. Galls, in France, by Renaud and Homberg, were found a remedy in Intermittents. The Academy ordered Lemery, Geoffroy, and other Members, to make trial of it, and their report was, that Galls did cure Intermittents, though not ſo conſtantly as the Bark. Bark, then, as an Aſtringent, may only be of a ſtronger nature, ſince proof remains of pure Aſtringents acting in the ſame way. Farther, it does not appear, from experiments mentioned, how much may be the effect of pure Aſtringents; for Renaud only gave the medicine in a ſmall doſe; for in the exhibition of Aſtringents we are ever in fear of exceeding in quantity; and it has been objected to the Bark, ſuppoſing it an Aſtringent, that by its exhibition in the quantity given, we ſhould be in danger of ſuppreſſing healthy evacuations. It is poſſible, then, that had the Galls been given in ſufficient doſe, they had much oftner effected a cure. Others, who are of a different opinion, allow the Aſtringents may cure Intermittents, but that that is very ſeldom, and that it is abſolutely neceſſary Bitters ſhould be joined with Aſtringency. Hence it is, that in Germany they uſe Trifoil and Tormentil joined, and with ſucceſs.

As Aſtringents, in many other caſes, are antiſpaſmodic, it is highly probable that the action of the Bark is nearly of the ſame kind.

Whether

Whether in any ſenſe it is antiſpaſmodic, in the common acceptation of the word, I ſhall not determine. Its operation may be explained in this manner.

I have formerly told you what I meant by Tone of the fibres. Tonic medicines are ſuch as give this tone to the fibres, oppoſed on the one hand to rigidity, and on the other to laxity. That ſuch a tone takes place in the whole fibres of the human body, eſpecially in the blood veſſels, where ſome have doubted it, appears to me ſufficiently evident. This tone depends on the firmneſs of coheſion of the ſimple ſolids, and on the influx of the nervous power. The firſt being commonly given, it is plain tone muſt depend chiefly on the laſt. Now although it be doubted of the muſcular fibres of the blood-veſſels, yet as they are of the ſame nervous origin, they are therefore depending, for their tone, on a certain influx of the nervous power. Nothing is more common than to ſee mobility depending on *atonia*, as Hoffman terms it. By encreaſing the tone of our fibres, does the Bark ſeem to act in obviating the return of ſpaſmodic affections. All this will be confirmed by attending to the hiſtory of Intermittents, and the proper exhibition of the Bark in them.

In their paroxyſm it is pretty evident, that amidſt thoſe ſpaſmodic motions which occur, there is always a conſtriction in the ſurface of the body. Our tonic medicine encreaſes that conſtriction, and therefore ought not to be exhibited in the hot fit where that takes place.

That Conſtriction, eſpecially at the beginning of the diſeaſe, not only remains through the whole fit, but alſo in the interval, and therefore it is neceſſary to allow the diſeaſe to go on, through ſeveral paroxyſms, till by repeated ſweats the conſtriction is removed. Hence the caution of practitioners, not to give the Bark till after the diſeaſe has had a few returns.

In proof of Conſtriction taking place in the extreme veſſels, the blood, during the paroxyſm, is collected in the viſcera or abdomen.

Till this determination, therefore, be taken off, and the balance reſtored to the ſurface, it is imprudent to exhibit the Bark. Hence we premiſe Emetics, to determine to the ſurface and take off obſtructions, in the abdominal viſcera. When the Bark is exhibited, it muſt be joined with purgatives, to obviate the aſtriction in the *primæ viæ*, and the obſtructions we have mentioned. When theſe are removed, we muſt obſerve, that the purgative effect of the Bark itſelf, or the exhibition of other purgatives along with it, will diſappoint our intention. The reaſon is this: It is found, that every debilitating power applied to the body, ſuch as evacuations, cooling medicines, *&c.* favour the return of Intermittents. Hence, then, the evacuation produced, either by the Bark itſelf, or other ſubſtances, does more than compenſate by its weakening effects, the power of the Bark, in ſtrengthening the tone of the fibres. Sometimes, however, effects may be mixed, and the Bark anſwer where a purging enſues. Here, although the chief operation of the Bark be on the ſtomach, yet a part of it may be carried into the blood, and obviate, compenſate, or overpower the effects of the purging.

Wherever an inflammatory diatheſis obtains in the ſyſtem, wherever the *vis tonica* is increaſed, there the Bark is hurtful. In the blood veſſels this increaſe of the *vis tonica* appears from the tenſion of the pulſe. Hence it is the Bark is not near ſo effectual in vernal, as in ſummer or autumnal agues.

On the contrary, wherever a putrid diatheſis prevails, there the *vis tonica* is diminiſhed below the ſtandard, and there univerſally the Bark is uſeful. I am very ready to allow, with Dr. Pringle, that a putreſcency accompanies Autumnal Intermittents, and that the Bark is noted for its antiſeptic quality. But the ſmall quantity given, and ſtill more, the very ſmall quantity extracted, and the little that muſt be abſorbed of that quantity extracted, to me would ſeem to have very little effect in preventing the putreſcency of the fluids. Much more do I imagine (and Dr. Pringle conſents to it, and enumerates other Aſtringents which have the ſame property) that the Bark, in ſuch

ſuch caſes, acts by reſtoring tone to the fibres, debilitated by putrefaction.

Hence not only in Autumnal Intermittents, but in all putrid Fevers and in putrid diatheſis of all kinds; in all remittent Fevers, where the remiſſion is evident, and in anomalous or malignant Fevers, where a putrefaction takes place, the Bark is uſed with advantage. With regard to continued Fevers, there alſo the Bark is employed; but with more diſpute than in the former caſes, and without any perſons, as far as I know, having aſcertained the ſtate of continued Fevers in which it ſhould be exhibited. Continued Fevers are not what the antients called *Febres continentes, viz.* ſuch as after the cold fit had a hot fit following it, and continued during the whole courſe, till the Fever was terminated by a criſis. There is a diſtinction betwixt the *Febres continentes* and *continuæ*; for in the laſt they acknowledged an intermiſſion to occur. In my practice I have never been able to ſee a continent Fever, and I find, from the accounts of the antients, that they confirm me in this. Hence I would alledge, that every Fever whatever conſiſts of the return of a repeated number of paroxyſms. If this be the caſe, and as the return of the paroxyſms depends on that of the cold fit, it is plain that by obviating the return of ſpaſmodic acceſſion, the Bark may be as uſeful in continued, as in intermittent Fevers. But the difficulties attending the exhibition of the Bark in Intermittents, are much greater here. *There*, as the Bark can neither be given in the cold nor hot fits, nor ſometimes even in the interval, when the conſtriction on the ſurface is not removed, it is plain that *here* the exhibition will be more dubious, where the effects of the hot fit will be more continued. Wherever an inflammatory diatheſis and encreaſed *vis tonica* are preſent, we muſt certainly avoid the Bark; and in the continued Fever, it is very difficult to aſcertain the times of acceſſion or remiſſion, another obſtacle to its uſe. *If a diſtinct remiſſion appear, we may exhibit the Bark with confidence and ſucceſs.* No body better illuſtrates this than Cleghorn. When the Bark was not given at the intermiſſion, his patients died. He watched the time of intermiſſion,

termiſſion, and, given then, found the Bark ſucceed in caſes termed deſperate. If any body would ſtudy this ſubject farther, he muſt conſult Dr. Morton, a writer who abounds as much in practical facts and obſervations as any, but, as falling into a ſyſtem of theory very different from the ſimple ſagacity of Sydenham, too much neglected. He conſtantly uſed the Bark in continued Fevers with the cautions mentioned. One caſe, however, of continued Fever (whatever ambiguity may remain as to the reſt) there is, where the Bark may be employed without regard to intermiſſion, *viz.* wherever a putrid diatheſis has gone to a great length in the ſyſtem. I would alledge this often takes place where the diſeaſe is very inflammatory in the beginning. Wherever *maculæ*, *petechiæ*, *&c.* appear, there, I think, the Bark may be univerſally employed. A diſpute is carried on between De Haen and Pringle about the nature of *petechiæ*. From the experiments of the latter it appears, that in all ſuch caſes the Bark is the remedy chiefly to be truſted. De Haen, in his *Ratio medendi*, gives many inſtances of putrid Fevers cured by this remedy; and other writers, who have uſed the Bark in theſe Fevers, give ſimilar inſtances of its good effect. For the uſe of the Bark in Fevers, beſide the authors above-mentioned, you ſhould carefully conſult Franciſcus Torti, in his *Therapeutice ſpecialis*, and Warhoff, *De Febrib.* edit. 1745.

In Dyſentery the Bark is not ſo frequently employed as in ſome of the foregoing caſes, but ſtill ſo often as to convince us of its utility. I conſider Dyſentery as a febrile diſeaſe, and every body knows, that it is founded in, or cauſes a putrid Diatheſis. This diſeaſe in the beginning is often inflammatory, and then the Bark is improper. Such inflammatory Dyſenteries, by continuance, often grow putrid, and in all ſuch, as well as the originally putrid, the Bark is of great efficacy. In one of theſe caſes, if given in ſufficient quantity, the action of the Bark may be conſidered as antiſeptic to the fluids in the *primæ viæ*; but in a more advanced Dyſentery it muſt act chiefly as aſtringent. We have had much delicacy in the uſe of Aſtringents in the Dyſentery, but, in general,

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we ſhould ſucceed much better, did we exhibit them more frequently, and more early than we do. Dyſentery, as Sydenham terms it, may be conſidered as a *Febris introverſa*, with conſtriction of the ſkin. Now the Bark, as a tonic medicine, may not only be more ſafely applied than ſimple Aſtringents, but will likewiſe act in reſtoring the equilibrium to the ſurface. Several writers have taken notice of the uſe of the Bark in Dyſentery; you may conſult a treatiſe by Wilſon at Newcaſtle.

Bark is alſo employed in Gangrene and Mortification. Its efficacy is now ſufficiently eſtabliſhed by univerſal conſent. If any doubt remain of its virtue here, where the ill ſucceſs has not ariſen from miſmanagement, it may, perhaps, be thus explained. There are properly two kinds of Gangrene; the one kind ariſing from the violence of inflammation purely, the other from a flaccidity of the veſſels of the part, or, at the ſame time, an *atonia* of the whole ſyſtem. Every body knows the firſt; the laſt is what occurs in hydropic, paralytic, or old people. It is in the laſt, that the Bark ſeems peculiarly appropriated, and very ſeldom, in theſe caſes, if given in a proper doſe, does it fail to bring on a ſuppuratory inflammation, and ſeparate the mortified part. In purely inflammatory Gangrenes, if it has not been ſucceſsful, it is from improper exhibition, and the reaſon is obviouſly this, that the Bark, acting by giving tone to the moving fibres, muſt certainly be hurtful where that is ſo much encreaſed by diſeaſe.

We have attempted to cure Fevers by a variety of Stimuli, in order to excite ſuch a degree of Fever, as might obviate the degree of acceſſion. But the Peruvian Bark does not operate by its aroma; for the pulſe by it is not encreaſed above its healthy ſtandard; and although it takes off flaccidity, yet it does not irritate the heart and veſſels. It is neceſſary to obſerve this, in order to talk of the cauſe of the cure of ſuppuration. Where ſuppuration is wanting, it depends very often on the flaccidity of the part. In this caſe, it is brought on by Stimulants applied to the part. It is in this manner

manner that I think all the balſamic ſubſtances act, and likewiſe Copper and Mercury, *viz.* in reſtoring the tone of the flaccid fibres. In the ſame way, in ſtagnating, ſanious, and ichorous Ulcers, the Bark mends the ſuppuration, and brings on a kindly healing of the ſore.

Not long ago the Bark has been ſaid to cure Cancers, but in all of theſe its effects are not remarkable; and we are here liable to be deceived, as very often where there is an Ulcer *mali moris*, it is apt to be confounded with a Cancer. But even in Cancers I have ſeen its good effects, and the matter mended by its uſe; and Ulcers *peſſimi moris* I have ſeen cured by it. In ſhort, wherever a ſuppuration is to be carried on, not in its own nature inflammatory, and wherever, in ſuch caſes, there is a tendency to the ſinking of the *vis vitæ*, the Bark is uſeful. Hence, ſucceſsfully it has been exhibited in the Small Pox, which I conſider merely as a ſuppuratory diſeaſe. Wherever the Small Pox are attended with an inflammation round the puſtules, and that inflammation extends to the reſt of the ſyſtem, the Bark may be pernicious, and is certainly hurtful; whereas at thoſe times where a putrid diatheſis is more evident, and the topical inflammation does not appear, it has been as remarkably uſeful in bringing on a proper ſuppuration. If any doubt remain of its efficacy in the Small Pox, it is from its promiſcuous uſe. You ſee it ought properly to be confined to the ſuppuratory ſtate, and, in general, ought not to be given till the fifth or ſixth day. I know it has been uſed in the eruptive Fever, but I imagine with bad conſequences; for where there is an inflammatory ſtate over the whole body, it muſt certainly do miſchief. This laſt rule is without exception, except in Small Pox of a ſingular kind, where, from the very beginning, they appear with *petechiæ*. As to the ſecondary Fever of the Small Pox, its uſe there is more doubtful. This I know, that very often, (and it is commonly the caſe,) that Fever is inflammatory, and much better cured by blood-letting and purging, than any other means, and rendered worſe by the uſe of the Bark; for by the eruptive

Fever

Fever the body is left in an inflammatory ſtate. In the Meaſles this is very remarkable, and alſo occurs in the Small Pox, and I take it, that wherever an evacuation is to be carried on, the Bark is inconſiſtent, ſuperfluous, or hurtful, and then only uſeful where a putrid diatheſis is very evident in the firſt part of a ſecondary Fever, or apt to occur in its continuance.

As efficacious in Ulcers and in the Small Pox, ſome have thought of extending the uſe of the Bark to internal Ulcers, and have uſed it in the *phthiſis pulmonalis*. Phyſicians now ſee that its bad effects are evident, and almoſt inevitable in this caſe. The reaſon is, that the *phthiſis pulmonalis* is accompanied with an inflammatory ſtate. A practice, about thirty years ago, was propoſed by Dr. Dover, of curing Conſumptions by frequent and ſmall bleedings, and I myſelf have ſeen a phthifical perſon bled to the fiftieth time, and I never ſaw the blood drawn in ſuch caſes without that cruſt which is the ſign of inflammation. Very often the caſe is purely inflammatory, and almoſt always partly ſo.

Theſe are the principal uſes of the Bark, in which I have endeavoured to explain its operation. Some ſpecial caſes yet remain. The Bark has been employed in ſcrophulous caſes. The Scrophula is attended with Ulcers *mali moris*, depending on a flaccidity of the veſſels of the part, and of the ſyſtem in general very often; ſo that here the Bark is plainly indicated, and I make no doubt of the ſucceſs had by Doctors Fothergill and Fordyce in ſuch circumſtances. But it muſt be obſerved, that the Bark very often fails in this diſeaſe. But even theſe Gentlemen have not always ſucceeded, becauſe I imagine this diſeaſe is often not to be cured certainly by any medicine; for it ſeems often a diſeaſe of the lymph, ſeated in the lymphatic veſſels, and not depending ſo much on a general flaccidity of the ſyſtem in general, as in ſome peculiar affection of the lymphatics, and matter generated there.

More ſucceſsfully has the Bark been given, as a remedy of ſpaſmodic affections, in the hypochondraic and hyſteric diſeaſe,

and in certain kinds of Aſthma; but here not with ſuch ſucceſs as to be reckoned a ſpecific. Wherever diſeaſe depends on a mobility, and that on a debility, and wherever theſe are cauſes or effects of diſeaſe, and not complicated with obſtructions formed, there the Bark may be ſafely and ſucceſsfully employed. In the hypochondriac diſeaſe, then, where the viſcera yet remain entire, we may have recourſe to the Bark; but in the decline of life, when the diſeaſe is properly hypochondriac, and where there are conſiderable obſtructions in the viſcera, there it muſt manifeſtly do prejudice. On the contrary, in the pure hyſteric diſeaſe, without labes of the viſcera, depending on cauſes acting on too moveable conſtitutions, paſſions of the mind, *&c.* the Bark is very proper, and ſhould always be uſed. Epilepſy often depends on ſimilar mobility, and here alſo it muſt be uſeful; but where that diſeaſe depends on a wrong conformation of the brain, little ſervice can be expected from the Bark. Sir John Floyer found the ſpaſmodic Aſthma, and the hyſteric, without labes of the lungs, pretty certainly relieved by the Bark, but wherever the lungs are over-loaded, and expectoration is neceſſary, there it is found hurtful.

In the *Chorea Sancti Viti*, or thoſe complicated, irregular, ſpaſmodic motions, which occur in perſons of a lax moveable conſtitution, the Bark is a remedy to be depended on. Sydenham propoſes this diſeaſe to be treated by evacuations, and in the beginning, where there is a fulneſs, they may certainly be neceſſary; but by their continuance, I have never ſeen the diſeaſe cured; while the Bark prevailed, after an unſucceſsful trial of them.

The Bark has been propoſed in the caſe of menſtrual obſtructions. Theſe are of various kinds. One ſpecies, which occurs at the firſt attack of the menſes, *viz.* the *Chloroſis*, ſeems, when we take a view of it, to be attended with all the ſymptoms of flaccidity and want of tone, and for this reaſon is commonly treated with Steel, and wherever that remedy ſucceeds, there have I ſeen the Bark exhibited with equal advantage. Menſtrual obſtructions, however, may ariſe from cauſes acting particularly on the uterus, and not on the

the ſyſtem in general, and there neither Bark nor Chalybeates ſhould be given. It is not very common to employ Bark in *Chloroſis*, or obſtructed menſes.

Much more commonly is the Bark exhibited in the *fluxu nimio menſium*. Here, too, Aſtringents and Chalybeates are employed, and given in ſuch quantity as to bring on ſtrong aſtriction. Whether the Bark anſwers equally well as an Aſtringent with the preparations of Iron, I ſhall not ſay. Wherever the profuſion depends on irritability and flaccidity, there I employ the Bark joined with *Sal martis*.

It has been a queſtion, whether the Bark may be employed in other Hæmorrhages? I think we may anſwer in the negative, generally. In caſes of Hæmorrhage that depend on mobility and debility, the Bark may be uſed with advantage; and in thoſe by long ſubſiſtence become habitual and periodical. But Hæmorrhages ſtrictly conſidered, and thoſe by unuſual outlets, are conſtantly of the inflammatory kind. Thus Hæmoptoë, in nine of ten caſes, depends on an inflammatory diatheſis. There may, however, be caſes of Hæmoptoë, which have long ſubſiſted, and are kept up by laxity, where both the Bark and Aſtringents may do ſervice. Theſe it is very difficult to diſcern, and where the inflammatory are miſtaken for them, bad conſequences will follow.

In Dr. Haller's collection of Diſſertations, there is one on the uſe of the Bark in Jaundice. I will not abſolutely deny the uſe of the Bark in this caſe. We might ſay, that other Aſtringents have been uſed for the ſame purpoſe. But now we know that Jaundice very often depends on ſtones in the biliary ducts, which paſs ſlowly through; ſo that the medicine given at the time of their falling out, *&c.* has imputed to it the virtue of curing the diſeaſe. It is not eaſy to ſee how medicines of this kind ſhould promote the paſſage of ſuch ſtones, and at any rate, from the Author of the Diſſertation, we cannot be certain of the

effects of the Bark. He ſeems unacquainted with the poſſibility of the accidents above-mentioned, and joins with the Bark * a farrago of other medicines, ſome of which, perhaps, are more adapted to the cure of the diſeaſe.

There is another diſeaſe, in which the Bark is employed, *viz.* Chin-cough. I have had frequent experience of the uſe of the Bark here. The efficacy of the Bark here ſhews the diſeaſe of the ſpaſmodic kind, or, the ſpaſmodic nature of the diſeaſe being given, ſhews the reaſonableneſs of uſing the Bark in it. Wherever a child can be made to take the Bark in ſufficient quantity, by the mouth, it is almoſt a certain cure for the Chin-cough; and even by injection, though not ſo conſtantly, it ſucceeds. As to the time of exhibition, when the diſeaſe is recent, and there are ſymptoms of an infarction in the lungs, while yet no ſolution of the ſpaſm appears, nor expectoration takes place, I imagine the exhibition of the Bark is dangerous, and bleeding and emetics muſt be premiſed. Often in the Chin-cough a bleeding at the noſe and vomiting enſue, both which are favourable ſymptoms, and therefore before a bleeding at the noſe or vomiting enſue, if there be not a certainty of no infarction in the lungs, I never gave the Bark; but after theſe I always exhibit it with ſucceſs. I have had in the exhibition of this remedy in the Chin-cough little regard to the Fever, except in the beginning, always giving it where the diſeaſe has been drawn out to a great length. The only caution to be regarded is this, *viz.* to avoid giving it in the evening hours, where an exacerbation of the Fever enſues, and rather to exhibit it in the morning and forenoon, ſtopping before the mid-day acceſſion.

I have only to add one more practical direction, which I had not an opportunity of mentioning. I mentioned how apt Intermittents were to return, from habit. This leads us to give the Bark in conſiderable quantity. The Bark has been ſaid not to cure Quartans. In theſe the tendency to continue is very great, and a large

* Beſides, he gives the Bark in too ſmall quantity to produce any effect.

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proportion of Bark is neceſſary; nor, indeed, ought it to be limited to any quantity, but given in as great as the ſtomach can bear. There are inſtances of perſons taking ʒj. without bad conſequences; and I myſelf have ſeen ʒſs. exhibited with great ſafety. In general, the bad effects of the Bark depend on exhibiting it in improper caſes, ſeldom on the quantity given. We are often ſtraitened with regard to the interval of the Bark; but here, as in the Quotidian Ague, we ought never to exhibit it, but between the paroxyſms. Some are ſo nice, that although the paroxyſm does not appear, yet they ſtop the exhibition of the Bark, till the time in which the interval ſhould again appear. But I find, that if the paroxyſm is ſtopped, and no ſenſe of the pain in the nails, languor, *&c.* take place, we may continue with ſafety; and by this method have I cured Agues which would not yield in the other way.

It has been objected to the uſe of the Bark, that Intermittents are apt to return, that there is no end of pouring in the Bark, and that the ſyſtem will be deſtroyed by it. But I am perſuaded, that this is owing to not continuing the Bark in ſufficient quantity; for though the paroxyſm diſappears for a ſhort time, yet the tendency ſtill remaining, it ſoon gains ſtrength and recurs. We ought to proceed in this manner. After the diſeaſe is removed, we ſhould return to the uſe of the Bark in three or four days; after that in the interval of a week, then a fortnight, and ſo on, if I may ſo call it, during the epidemic ſeaſon.

As to the pharmaceutical treatment of the Bark, it ought always to be exhibited in large quantities, and in ſubſtance; for the powers of the ſtomach ſeem much greater upon it than thoſe of any menſtruum out of the body. With ſome reaſon it has been imagined, that the action of the Bark is upon the ſtomach. Hence it has been ſaid, that all fluid preparations of it paſs off by the pylorus, and for that reaſon do not anſwer ſo well as the ſimple Bark, which remains much longer. This reaſoning is ingenious, but we may be ſatisfied with what was alledged of the ſmallneſs

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of the quantity extracted. With regard to the extraction, long boiling deſtroys its virtues. Ten grains of the Extract has been ſaid to be equal to ʒſs. of the Bark in powder; but in practice I find that equal quantities are neceſſary, and conſidering the long coction deſtroys the texture, as much as it enlarges the quantity extracted, it is no wonder that it is ſo. As ſpirits diſagree with many, wherever extraction is neceſſary, we muſt employ water; and infuſion with water is preferable to decoction, being equally ſtrong and preſerving the aroma. By gentle heat we may evaporate the infuſion to any quantity.

ACORUS VERUS, or CALAM. AROMATICUS.

The place of this is uncertain; whether it ought to be placed among the *Aroma* here, or among the Bitters, whoſe qualities it alſo poſſeſſes. As not remarkable for any of theſe virtues, it has been, of late, neglected. I have placed it next the Bark, as it has been frequently employed for the ſame purpoſes. Upon good authority, I found it had cured Intermittent Fevers. I myſelf had it tried, and found it alone to do ſo. How far it is to be depended upon in ordinary caſes, farther experience muſt determine. It is much of the ſame nature with the Bark, aromatic, bitter, and aſtringent, pretty evidently, but contains more eſſential oil. Like the Bark, it muſt be given in large doſes, and in ſubſtance. Haller gives it in ʒij. The ſtomach bears better a large doſe of it, than of the Bark.

The three next plants belong to the *Verticillatæ*, and might have been mentioned with the *Scordium*, *&c.*

Chamæpitys. This, with the Chamedrys, Gentian, and Centaury, enters into the Portland Powder, formerly mentioned. Its acrimony is of the terebinthinate kind, and hence called in England Ground-pine. To ſhew the analogy of theſe plants, Shaw tells us, that in Barbary the *Chamæpitys* is uſed with ſucceſs in Intermittents. As to the

Mar-

Marrubium, it is the ſtrongeſt Bitter of the claſs, and frequently employed for the uſes of other Bitters. Its uſe is not properly defined. I cannot agree with *Materia Medica* writers, who conſtantly make it pectoral. It is not ſupported by analogy. Few of the *Verticillatæ* are pectoral, and many more of them are bitter, without any antiſpaſmodic quality. There is nothing in which we are more apt frequently to be miſled, than in ſuppoſing acrid medicines to act as pectoral.

Dictamnus albus. This is a ſtrong, ſimple, and pure Bitter. I have had no account of it. The root of it is uſed. Many plants have a ſtrong odour exhaling from them, which I imagine is their eſſential oil. *Dictamnus albus* is the only one which will ſhew the inflammability of this vapour, which in it will take fire, on the application of a candle. Next to theſe three ſtands the

LUPULUS, HOPS.

This is a pretty ſtrong Bitter, with a ſlight aroma. In Spain, from good authority, I know it is uſed as a Sudorific, to baniſh the remains of the Venereal Diſeaſe. Like other Bitters, it prevents fermentation and acidity in vinous liquors; hence it is uſed as a condiment to ales. Whether there is any thing peculiar in Hops, is very uncertain. Before the introduction of theſe, other Bitters were uſed for the ſame purpoſe, and poverty obliges ſome to uſe theſe ſtill, and from experiments I have found them equally effectual. With regard to gratefulneſs, experiments muſt be repeated with different quantities. Much has been ſaid of the effects of Ale or Beer, in calculous caſes; but I imagine they can have little effect, either in generating or removing *calculi*. We have reaſon to think, that theſe depend on peculiarities of conſtitution and habit, not eaſily removed by diet of any kind.

TRI-

TRIFOLIUM PALUSTRE.

Both the leaves and roots of this afford a ſtrong Bitter, without any aromatic acrimony, approaching in ſenſible qualities to the Gentian and Centaury, but more harſh and diſagreeable. It is applied to all the purpoſes of Bitters, and has been celebrated as an Antiſcorbutic. There is no doubt but all Bitters, as antiſeptic with regard to the fluids, and tonic and conſtringent with reſpect to the ſolids, may be employed with ſucceſs in Scurvy, though not by themſelves, but accompanied with aceſcent aliment. With regard to Trefoil, I do not ſay its virtues are great in this reſpect. I imagine it very doubtful whether it is properly or not given by the Germans.

This finiſhes the *Amara calida*. We ſhall now make a few obſervations on their

PHARMACEUTICAL TREATMENT.

Pretty univerſally they are more agreeable in their dry ſtate than in their recent. Moſt of them contain an oil, of which a portion is more volatile than the reſt, and gives a rank, diſagreeable odour to the ſubject, and, which I imagine is not without foundation, thought of a narcotic, inebriating quality. This odour is loſt by drying, and even the mildeſt Bitters, *e. g.* Centaury, have ſome of it. When any conſiderable efficacy is to be expected from their uſe, they ſhould be exhibited in ſubſtance, both on account of the difficulty, except they are in a very tender herbaceous ſtate, of extracting them perfectly, and perhaps alſo from its being neceſſary they ſhould be detained ſome time in the ſtomach. Another obſtacle is, that in their recent or diſſolved ſtate, they are much more apt to run off by ſtool than when dry. Their Bitterneſs does not reſide in an eſſential oil to be raiſed by diſtillation, but in a more fixed, partly gummy, and partly reſinous ſubſtance, and therefore to be extracted both by water and alcohol; by water a greater quantity, by ſpirit a ſtronger, purer, and more elegant Bitter being extracted, which leads

leads us to think that it chiefly reſides in a reſin. The more heat is applied in the extraction, the Bitter will be more diſagreeable, and by boiling, the whole of the eſſential oil will be diſſipated. It is true the more pure Bitter ſtill remains; but I think it very doubtful whether alſo ſome virtue does not depend on the Aroma, united with the Bitter. In extracting theſe Bitters we want to ſhun their diſagreeableneſs. Spirit, without deſtroying the quality, renders the Bitter more agreeable; water renders it more harſh, and wine, though rather a watery than a ſpirituous menſtruum, yet here corrects the Bitterneſs; but whether without changing the virtue is not certain. All the foſſile acids, in a very ſmall quantity, deſtroy Bitters. Perhaps it is from the acid in wine, acting in this manner, that it mitigates the nauſeous taſte of the Bitter. For my part, I think it very doubtful, whether acids are well employed in extracting acrid ſubſtances. The very ſtrong Squill may ſtill retain its properties, but this will ſcarcely apply to others. Alkali, too, is ſometimes added, but contributes nothing to the extraction; for the ſame colour, *&c.* is procured by adding alkali to the common ſolution after it is made, as before. It does not, however, impair the qualities, and therefore is very properly added as a diuretic to our Bitters.

AMARA FRIGIDA.

Theſe, on a wrong foundation, have been ſuppoſed of a cooling virtue. The miſtake has probably ariſen from the method of our uſing them at table, young and blanched, and then containing only a mild vegetable juice.

The four firſt belong to the ſubdiviſion of the *Syngeneſia*, the *Semiflosculoſæ*. This order are all lacteſcent and acrid, and commonly containing an oily matter, which when dried is inflammable. They are all ſuppoſed of a poiſonous nature. Theſe here are the only exceptions, with ſome of the campanaceous tribe of plants, containing a milky juice, and not being poiſonous. Even here their quality is ſuſpected, and ſome of them, as the *Lactuca*, is reported to have a

ſtrong narcotic virtue; and therefore, although theſe four were ſet down as a ſpecimen of the whole, the analogy muſt be transferred, with very great caution, to the reſt of the tribe. Even the eſculent Lettuce, by Galen, is maintained to be of a poiſonous nature. This was probably owing to the heat of the climate, but it ſhows the tendency of ſuch plants. Beſides the milky juice, theſe plants contain an eſſential ſalt, in which the cooling quality is ſuppoſed to reſide; but it cannot be extracted in ſuch quantity as to ſhew that effect. As to their medicinal qualities, they have the common virtues of Bitters. *Materia Medica* writers conſtantly talk of their aperient qualities, and imagine them almoſt ſpecific in viſceral obſtructions. In confirmation of this they prove purgative, and in that manner may be uſeful to the hypochondriacs. Boerhaave has a particular affection to the *Amara frigida*, and ſuppoſes they have a power of diſſolving the *atrabilis* he thinks preſent, and of waſhing off impurities from the blood. I have employed the juice of the *Dens leonis* in the quantity of ʒiv. but neither obſerved its laxative nor diuretic power. Boerhaave talks of their ſaponaceous quality very much, but without any preciſion; for whenever we loſe ſight of a combination of alkali and oil, and talk of a ſapo compoſed of any ſaline or inflammable ſubſtance, we can convey nothing diſtinct to the reader, nor accurate as to what virtue we mean the ſubſtance exerts. I deny ſuch ſoapy qualities, and with regard to the *Amara frigida*, their uſe in medicine is not yet aſcertained. After theſe is inſerted

FUMARIA,

Not from its being a-kin in natural order, but becauſe it reſembles thoſe we have mentioned in ſenſible qualities, in which Sir John Floyer talks of a ſmoaky ſooty taſte. It matters not whether the term is preciſe, ſince the *Fumaria* and the former certainly agree in taſte, and in the ſame aſcribed virtues. To me it is more purgative, and therefore more fitted to the Hectics and Hypochondriacs. Oppoſite to *l* ſtands the term

ACRIA.

ACRIA.

By this I mean ſuch plants as are ſimply acrid, without any Aroma or Bitterneſs joined. If I were again to make up the liſt of Stimulants, I ſhould transfer many of them to the claſs of Evacuants, as Diuretics, *&c.* but this is an error of no great conſequence.

ARUM.

This is very acrid in its recent ſtate, but inert when dried; inſomuch as ſometimes to be employed in food. It ſtimulates the ſtomach, and promotes appetite and digeſtion; ſtimulates the inteſtines, which, by its effects, if given in quantity ſufficient, it will diſcover; is remarkable for ſtimulating the kidneys, and like moſt other ſubſtances, which do ſo in the mucous glands of the *Bronchiæ*. Hence we ſee it is a-kin to the Squills, but more pungent and volatile. It is much out of practice at preſent, and for a very good reaſon, becauſe it is very difficult to procure in a proper ſtate; for when recent, it will not powder, and when we attempt to dry it, we are apt to go too far.

EUPHORBIUM.

It is an acrid Stimulant, uſed only externally. As exerting an attrahent virtue, it ſhall be conſidered in another place. It might have been transferred to the Purgatives.

IMPERATORIA,

Belongs to the *Umbellatæ*. The part employed is the root. It is more acrid than the former *Umbellatæ* enumerated. Since I ſpoke of theſe, I have examined the root of *Angelica*, and find it equally acrid with the *Imperatoria*, and therefore ſuſpicious.

IRIS NOSTRAS.

This term implies ambiguity. So far as we can perceive, the whole genus of the *Iris* is remarkably acrid, both the flowers and

roots. It is a great miſtake to give the *Iris paluſtris lutea* the qualities of aſtringent, and recommending it as ſuch. It is equally acrid with the *Iris* in our Diſpenſatory. The *Iris Florentina* is acrid, too, in its recent ſtate. I take the virtues of all of them to be the ſame as thoſe of the *Iris lutea* in their recent ſtate, *viz.* that of a very ſtrong Errhine when ſnuffed, as I have ſeen it not only cauſing ſneezing, but inflammation of the noſe and head. Internally it is a ſtrong cathartic, and anſwers as a Hydragogue. In the Medical Eſſays you may ſee it employed in one caſe: I have ſeen it in ſeveral others. The doſe is ſet too high, *viz.* ʒij. Two drachms is farther than I would chuſe to go. Even fifty drops of the juice will prove purgative. In exhibiting it we ſhould begin with ſmall quantities at firſt.

PERSICARIA URENS

Is an example of the difference in ſubſtances, connected by botanical analogy. It is remarkable for acrimony, although the reſt of its genus are mild. Its acrimony operates chiefly on the kidneys, and it proves diuretic. I have had no experience of it. What is remarkable, it gives out its diuretic virtues, in diſtillation, to water, which ought to be tried on other ſubſtances beſides the *Perſicaria*.

PYRETHRUM

Is an acrid, which reſides in the leaves and in many of the roots of its order. It is employed as a maſticatory in the Tooth-ach. It belongs to the *Compoſita*.

SEDUM MINUS ACRE.

Another inſtance of different virtues in plants of the ſame genus. Its qualities approach to thoſe of the *Siliquoſæ*. It has been employed as emetic, and its effects may go farther in the ſyſtem. The ſeeds are of a ſtrong acrimony, and confined entirely to external uſe, in deſtroying ſome vermin which infeſt the body.

WINE.

WINE.

We have here no perfectly pure Wines. As moſt of thoſe we employ are the produce of foreign countries, either before or after importation, they fall into the hands of the trader, where ſuch additions are made to them, were they pure of themſelves, as would contaminate that purity. But as all Wine is prepared from a ſaccharine juice, which undergoes fermentation, and as the whole is not converted at once, but changed only ſucceſſively, one part will remain unaſſimilated, while another has gone a further ſtep, and become vinegar. And thus in all Wine we have theſe three parts, *viz.* 1ſt, A quantity of unaſſimilated Muſt; 2dly, A vinous liquor; and, 3dly, A quantity of vinegar. We ſhall firſt mention the properties of the ſeveral parts of Wines by themſelves, and then talk of the properties of theſe ſeparate parts combined.

Every Wine conſiſts, more or leſs, of theſe three parts: *Muſt*, *pure Wine*, and *Vinegar*; for it is almoſt impoſſible, either to have fruit ſo maturated, or ſo to conduct the fermentation, but a portion of each of theſe muſt appear.

1. MUST.

Sugar alone ferments in the ſtomach, gives out a *gas ſylveſtre*, acts on the bile, has a laxative property, *&c.* Whether the Sugar diffuſed in *Muſt*, owing to its mixture with the native juice of vegetables, may have theſe effects varied, I ſhall not ſay. Certain it is, that *Muſt* acts in a leſs quantity than Sugar. *Muſt* may be conſidered as cauſing in the ſtomach fermentation or acidity. Its effects, then, are of two kinds; 1. of the *gas ſylveſtre* generated on the nerves. In ſo far as that is generated from the fermentation of *Muſt* in the ſtomach, it will deſtroy the tone of the ſtomach, diſpoſe it to ſpaſmodic contractions, and conſequently diſturb and interrupt the courſe of digeſtion. 2. If acidity is produced, it will join

join with the *gas ſylveſtre* in weakening the ſtomach; the acid thus formed will unite with the bile, produce a ſtrong ſtimulus, thus occaſion a flow of more bile to the inteſtines, and cauſe a *Cholera morbus*, with violent ſpaſms, and copious evacuations upwards and downwards. Although theſe conſequences of the *Muſt* may go thus far, yet they are commonly more mild.

2. WINE.

The diſtinguiſhing property of that part of the *Muſt* which is converted into Wine, is, that it now contains an Alcohol, at leaſt it is that on which the chief effects of the pure vinous part, which I ſaid was in Wine, depends. On this head, therefore, we muſt conſider the effects of Alcohol. 1. Alcohol applied to the fluids, coagulates them; 2. to the ſolids, conſtricts and hardens them; and hence, in ſtopping Hæmorrhages, may act in either way. Applied either to the fluids ſuddenly, or injected into the veſſels of living animals, in ſmall quantity, it will produce death. 3. In the ſtomach, its chemical effects on the fluids and ſolids may almoſt be neglected; nor can we ſuppoſe, with Boerhaave, that, carried thence into the veſſels of animals, it can be ſubject to thoſe viciſſitudes of heat and cold, producing condenſation and rarefaction, and thus unequal compreſſions, and thence diſeaſes. Alcohol diluted, loſes that ſtrong power to generate heat; it muſt alſo loſe its coagulating powers, diluted in the blood veſſels. Alcohol, internally, acts on the nervous ſyſtem purely, chiefly by means of the ſtomach. In ſmall doſes it ſimply ſtimulates, increaſes the action of the heart and veſſels, increaſes the nervous flow over the whole of the ſyſtem, whence more ſerenity and eaſe of mind, more clearneſs and livelineſs of imagination, and the vigorous exertion of every faculty. In large doſes it has a contrary effect; it deſtroys the mobility of the nervous power, in interrupting its flow from the *Senſorium commune*; whence from its ſedative and ſtimulant effects mixed, it produces confuſion of ideas and delirium; if the doſes are ſtill repeated, the nervous flow is arreſted, the voluntary and involuntary motions are deſtroyed,

ſleep

ſleep produced, lethargy, apoplexy, death. Theſe are the effects of the Alcohol of Wines. In Wines themſelves, eſpecially in the laſt ſtage, the effects are almoſt never ſo violent, for the Wine is neceſſarily thrown in more dilute at firſt, and in ſmaller doſes, and has, in a manner, the conſequence of one doſe diſſipated, before another is repeated, and therefore is more ſtimulant, and raiſes the ſpirits more. It does produce ſtupor, but ſeldom death; for beſides it being more dilute, from its ſtimulant qualities it is apt to be thrown up from the ſtomach, and again has, by the other matters in it, the powers of the Alcohol moderated. Whether the *Muſt*, *Acid*, and *Alcohol* are all in every Wine, I ſhall not determine. Certain it is, that if any body were to drink of pure Alcohol as much as they can drink of Wine, in proportion to the ſtrength it would have deleterious effects. Alcohol is more inflammatory too, and productive of an inflammatory diatheſis, than Wine, becauſe of the acid, *&c.* accompanying the latter. A proof of this is, that Punch, which is an artificial Wine, is leſs noxious than the ſame quantity of diluted Alcohol. Something alſo depends on the accuracy of mixture, for Punch, though leſs noxious than Alcohol, is more ſo than Wine. Hence I imagine it is a very bad practice to mix Alcohol with fermented Wines; for though it is better than Punch, and by very long digeſtion may be poſſibly mixed accurately with the Wine, yet it is far leſs ſafe than the ſame quantity of ſpirit, gained by the vinous liquors themſelves, during their fermentation.

3. ACID.

The Acid of Wines may be conſidered as of two kinds; 1. That Acid, which, during the whole progreſs of fermentation, is manifeſtly evolved, and which probably enters into the compoſition of Wine and Alcohol; 2. That which is generated, from part of the vinous liquor going on to the acetous proceſs more copiouſly and more ſeparate, then called Vinegar. This renders the Wine more grateful to the palate, ſtimulates the mucous glands, and quenches thirſt; and in the ſtomach, by obviating putrefaction, exerts ſomewhat of the ſame quality. Vinegar may always be conſidered as a

mixed

mixed body, at leaſt on moſt occaſions, containing, beſides the Acid, a part of unconverted, ſaccharine matter. As containing ſuch, it may be laxative in the inteſtines, have the effect of unconverted *Muſt*, generate *gas ſylveſtre* in the inteſtines, and, in ſhort, have all the properties of freſh juice. When thoroughly converted, it acts in another manner. By the quantity of Acid, it determines other vegetables to aceſcency, weakening the ſtomach, and, therefore, hurtful to ſuch as have their health very much depending on the tone of that organ in arthritic and hypochondriac caſes. This cooling quality in Vinegar may go ſo far as to imitate the effects of the *gas ſylveſtre*, prove ſpaſmodic, and have all the conſequences of Acid, generated in the ſtomach itſelf.

In ſo far as Wine contains Vinegar, or *Muſt*, it is not perfect; but it is unavoidable but that in every Wine we have, they ſhould be more or leſs preſent. In the combined ſtate of theſe qualities in Wine, they are much more innocent than we have deſcribed them as ſeparate; the Alcohol and Vinegar obviate the fermentation of the *Muſt*, the ſtimulant of the Alcohol obviates the cooling quality of the Vinegar, and this again, with the *Muſt*, the inflammatory conſequences of the Alcohol. There is in Wine a fourth ingredient, *viz.* Water, which, according to its proportion, moderates the other qualities.

In many countries weak Wine is uſed as common drink, without any bad conſequences. For my part, I imagine it has conſiderable advantages, tending to obviate the aceſcency of vegetable aliment, as we ſee in ſtrong Wines, taken with aceſcent fruits, and more univerſally the putreſcency of the animal diet. Hence, I imagine, dilute Wine is not improperly employed in thoſe countries where the food is chiefly animal, as obviating its noxious tendency, and promoting the excretion of the putreſcent parts of our food. As uſed with aliment, Phyſicians have, indeed, conſidered Wine as diluent, and moderately ſtimulating; as antiſeptic, and promoting the

ſecretions;

ſecretions; but entirely neglecting its nutritious quality. This, however, as containing *Muſt*, it certainly poſſeſſes.

As a medicine, we muſt conſider the effects of Wine in its different kinds, for according to the kind of Wine, muſt its effects be diverſified.

Wines may be diſtinguiſhed according to the progreſs of their fermentation, as crude, mellow, *&c.* In their crude ſtate, Wines will have all the bad effects mentioned of the *gas ſylveſtre*. When they are ripe, no ſuch ſhould appear. But in thoſe Wines we call mellow, there is always ſome unconverted *Muſt*, ſome gone over to acidity, and even ſometimes are what is called pricked, or apple-taſted. The effects of theſe will be eaſily underſtood, but it is often very difficult to be able to know theſe ſtates of Wine, for the Merchant takes every method of concealing them. We ſhall now ſay ſomewhat on the different qualities of Wines.

1. *Sweet and Sharp.* Sweetneſs in Wines may depend on the natural richneſs of the grape, its maturity, *&c.* but much more commonly is it the effect of imperfect fermentation, from racking off the vinous liquor from the lees, as ſoon as the fermentation is tolerably active, into new veſſels ſucceſſively, till once it be checked, and a ſweetneſs remain. Such are the Spaniſh and Italian Wines. Sweetneſs alſo may ariſe from the Vintner mixing with ſharp Wines a quantity of unfermented *Muſt*. The qualities are eaſily underſtood. Where the ſweetneſs, or rather crudeneſs of the Wine, depends on the quantity of *Muſt* preſent, it will have the ſame effects as *Muſt*, generate *gas ſylveſtre*, prove laxative, purgative, *&c.* Where the ſweetneſs depends on the native richneſs of the grape, the bad effects will be obviated by the greater quantity of Alcohol, as in Canary and Tokay. But even in theſe, I am perſuaded the richneſs of the juice, and the viſcidity attending it, prevent the generation of as much Alcohol as might be produced; and accordingly we find that theſe Wines have always a good deal of the effect of crude Wine.

Sharp Wines may have that property from different cauſes; 1. From the nature of the grape, to be judged of according to the climate. Thus the Wines of the Northern countries poſſeſs this property more than thoſe of the Southern. 2. Sharpneſs, whatever be the ſtate of the grape, ariſes from every active fermentation. 3. Sharpneſs may proceed from Wines being kept long, and partly converted into vinegar. In one caſe, then, you ſee, Sharpneſs is a ſymptom of weak Wine, and, therefore, of a cooling, leſs heating, and leſs inflammatory liquor. In healthy ſtomachs theſe may be more freely indulged, and prove good condiments for animal food, and likely to prove diuretic and antiſeptic. When the Sharpneſs proceeds from an unfiniſhed active fermentation, theſe Wines may be hurtful, as too cooling, and as debilitating the ſtomach, and thus produce arthritic and nephritic paroxyſms, and *hæmorrhoidal pains*, which alſo depends very much on the ſtomach's tone.

2. *Briſk and Flat*; *i. e.* more or leſs poignant. 1. Flatneſs of Wines may depend on the want of a due degree of fermentation. 2. Flatneſs may proceed from too great ripeneſs, or mellowneſs, and the Wine encreaſing in age. Thus Wine kept long in well corked bottles, not having the air neceſſary for the acetous proceſs, turns ſimply vapid. 3. When artificial means is uſed to prevent fermentation, it will induce Flatneſs, as brandy mixed with wines. Hence the Flatneſs of the Spaniſh and Portugueſe Wines, in compariſon of the French.

Briſkneſs alſo alone proceeds from an active fermentation preſent, and always implies more or leſs of a crude ſtate; whence, though more agreeable, it is more dangerous. A diſtinction of Wines is made into thoſe which are apt to affect the nerves and the head, and thoſe which produce fever. Champaign, from uſing it flowering in the cup, is very apt to intoxicate. Experienced drinkers have a rule for this; rejecting ſuch Champaign as retains its flower long in the cup.

3. *Strong*

3. *Strong and Weak.* Theſe are compatible with the various other qualities, but entirely depend on the quantity of alcohol. All wines are, in ſome degree, heating and inflammatory, but their property in theſe reſpects is not entirely to be meaſured from the quantity of alcohol. The ſame quantity of Wine diluted, intoxicates ſooner than the ſame quantity drank in the ſame time without that dilution; at leaſt this is a common obſervation of drinkers. The reaſon ſeems to be this, that the Wine, by this means, is applied to a larger ſurface in the ſtomach, and its dilution cauſes a quicker diffuſion over the ſyſtem. Some have endeavoured to explain this from the bulk of liquor in the ſtomach, but I cannot conceive it in that way. Though Wines thus diluted are, *cæteris paribus*, ſooner intoxicating, yet their effects are alſo ſooner over. With regard to the quick diffuſion, it is obſerved, too, that the Wine which provokes urine ſooneſt, is alſo the ſooner intoxicating; which proceeds plainly from its being applied to a larger portion of the ſyſtem. For whatever other purpoſes Wines are wanted, either as diluent, diuretic, or antiſeptic, the weakeſt are always to be preferred. Wine, you will now ſee, like Opium, has a double effect; as ſtimulant without the narcotic qualities, and, therefore, in theſe, there can be no ſafety; but in weak Wine we are ſafe, becauſe with theſe we can more eaſily ſtop, before the narcotic effects are exerted.

4. *Smooth and Rough.* Smoothneſs depends on the ſweetneſs or mellowneſs, except where it is miſtaken for flatneſs.

Roughneſs depends, 1. On the natural acidity and want of ſugar in the juice; 2. On the unripe ſtate of the juice. At firſt the fruit is of a hard cellular texture, which is filled firſt in the middle with a fluid, which gradually extends over the fruit; ſo that within the center is always ripeſt. Hence the difference between the juice flowing ſpontaneouſly, or from the grapes laid above each other, from that which is expreſſed; for every expreſſion gives acerbity. 3. Roughneſs may depend on artificial means, as the

addition of ſloes, by the vintner. 4. On the addition of huſks to Muſt in fermentation.

Acerb Wines are grateful to the ſtomach, check acesſcency, and are aſtringent over the whole of the *primæ viæ*; except when joined with much ſweetneſs, in which caſe they determine rather to the vinous than acetous proceſs.

5. *Colour of Wines.* Colour depends very little on the juice of the grape, the red grape, I am well aſſured, affording a Wine equally tranſparent with the naturally white. When a red Wine is wanted, the red huſks are thrown in, ſo that, *cæteris paribus*, the red Wines are more aſtringent. Here we are apt to be deceived. White Wines are rejected when brown and rough, which they grow by age; hence the merchant dies them red, in which kind of Wines ſuch qualities are expected. Sometimes alſo, the ſame practice is performed, from a greater demand at market. Hence little judgment is to be drawn from the Colour of Wines, without, at the ſame time, taking in the other ſenſible qualities, and the hiſtory of the fermentation.

We ſhould now proceed to give in detail the properties of ſeparate Wines, but our limited knowledge of the hiſtory of their fermentation, *&c.* forces us to ſpeak but very imperfectly upon this ſubject. We ſhall in general ſpeak of them, according to the country in which they are produced.

REMARKS on the WINES of different Countries.

The Wines of the Northern climates are generally of a weak body, more acid, and of a more ſharp taſte, and affording a larger proportion of tartar. The reaſon of their greater acidity is eaſily underſtood. With regard to the tartar of wines, we have not yet ſpoken of it. Tartar accompanies ſharpneſs and auſterity, and thence its effects are to be underſtood. Though tartar be a purgative, yet in any quantity we drink Wines, they cannot, from the

the tartar, be more active, or exert their purgative quality. Their laxative virtue is owing to the aceſcent Wine mixing with the bile. It has been alledged, that tartarous Wines are apt to produce the ſtone in the kidneys; but neither theory nor experience proves this. There is not the leaſt reſemblance between the ſtones, and the tartar in their nature, and Hoffman tells us, that thoſe who drink Rheniſh Wine were rather freer of it than the others. Hence, then, the qualities of theſe Wines depend chiefly on their weakneſs and acidity, and from theſe qualities their virtues may be underſtood. Of this kind are the Moſelle, Rheniſh, *&c.*

The Southern Wines are ſtrong, ſweet, and unctuous. The Hungarian Wines, *e. g.* Tokay, are ſuppoſed the beſt at preſent. The Canaries, though more Southern, do not afford Wines ſo rich as the former. The reaſon ſeems to be, that being inſular, the grape is expoſed to the cooling breezes of the ſea. Madeira is the growth of a warm climate; but from an accidental taſte, which prevails at preſent, a particular management of it has been introduced. In Madeira there are mountains upon which they can grow Wines as weak as thoſe of the Northern climates. Theſe, as more aceſcent, are more grateful, but, at the ſame time, more dangerous. In order to tranſportation, they have a quantity of alcohol mixed with them, and after that, to gain a proper degree of activity, require to be kept, for ſome time, in the warmer climates.

The Italian Wines, as Southern, ſhould be ſtrong, but from their being checked in the fermentation, are ſweet and weak. They come over to us in flaſks, covered with oil, and cannot be kept above a year.

The Spaniſh and Portugueſe Wines cannot be tranſported to us without brandy, and are the moſt inflammatory, and leaſt exhilarating Wines we employ.

The French Wines are certainly, with juſtice, preferred to the reſt. They may be conſidered as Northern Wines, and the beſt

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of them are produced in Northern Provinces, the Burgundy and Champaign. The French Wines have heat enough to give them ſtrength, but are not expoſed to ſuch an active fermentation as the former, and ſo not ſo apt to be combined with Brandy or Alcohol. Champaign is in active fermentation, and not ſo ſafe as the mellow Burgundy, but this formerly, from being imported in flaſks, was never properly mellowed, and was very heady. This practice is now prohibited, and we have a Wine leſs delicate, but more ſafe, particularly to the nerves. Claret, as weak and acerb, and tranſported without ſpirit, is ſafe in every reſpect.

MALT LIQUORS.

Both from want of care, and the difficulty of conducting the proceſs of their fermentation, theſe are never ſo perfect as Wines. They contain much farinaceous matter, and are more nutritious than Wines; but as more aceſcent, are more laxative; and, as more viſcid, leſs diuretic.

The eſſential Oils are placed next in our Catalogue, but I ſhall defer ſpeaking of them till we come to the empyreumatic, under the head of Antiſpaſmodics, when we ſhall meet them again, and treat of both at once. We go on, therefore, to

ANIMAL STIMULANTS.

As animal bodies are made up of mild and bland ſubſtances, and are themſelves of a mild nature, it cannot be expected we ſhould have many Stimulants from the animal kingdom. In ſome, perhaps in all animals, ſome of the ſecreted fluids may be acrid, and among the evacuants ſuch ſhall be mentioned. Here we are confined to the Inſect tribe, ſo very different from the reſt.

CANTHARIDES.

The acrimony and ſtimulus of theſe, from their common external uſe, is ſufficiently known. So conſiderable is it, that internally

nally they cannot be given, but in ſmall doſes. In large doſes their effects might appear general on the ſyſtem; but as we manage them, even in pretty large doſes, they affect the urinary paſſages only, very little the reſt of the ſyſtem. To me it ſeems very curious, that thus, without affecting the *primæ viæ*, they ſhould only exert their action on a more diſtant part of the ſyſtem. The reaſon ſeems to be this. In the *primæ viæ* they are conſtantly and equally diffuſed through the whole maſs of matter contained there, which is in ſome meaſure ſufficient to obviate the effect of *Cantharides*, which muſt be given in a great meaſure concentrated. In their farther progreſs in the blood, they are ſtill more diffuſed, and thence ſtill unactive, but from their connection to a particular portion of the blood; they are again collected in their concentrated form, in the kidneys, and conſequently there exert their effects. In proof that it is thus from its dilution, it does not act on the other parts of the body, even in the kidneys, if it is exhibited very weak. I have known half a grain of *Cantharides* bring on a ſtrangury, and yet if this ſame half grain was diluted in much water, *e. g.* it would have no effect at all. Hence it is very difficult to doſe them properly. When carried to the kidneys, they ſtimulate them, prove diuretic, and hence are recommended in Dropſies. Even here their dilution may in ſome meaſure account for their not ſucceeding, and if that be not the caſe, they then are found ſooner to affect the neck of the bladder, than to prove diuretic. Upon the ſame footing, they have been uſed in nephritic caſes. It is very doubtful whether Diuretics there are proper at all. Surely thoſe which are inflammatory will be prejudicial. Any effect they exert internally, is, I imagine, from their common enough action on the neck of the bladder, and urethra. By inducing an inflammation there, they cure Gleets. This I have formerly ſhewn, under the Balſamics, to be a fact, in whatever method it be explained. Whatever method has been recommended in the *Gonorrhœa benigna*, has been alſo recommended in the *Fluor albus*. Here, from the contiguity of the parts, it may act in the ſame manner we have mentioned; but to extend that effect, the inflammation in the urinary paſſages muſt be ſo great, as to

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make their exhibition very inconvenient. As diuretic they may be ſuppoſed diaphoretic, and hence probably have been recommended in cutaneous diſeaſes, as in the *Lepra* by Dr. Mead. I have ſeen them exhibited in this diſeaſe without any good conſequence. This, however, does not contradict their diaphoretic virtue. I imagine the *Lepra* is a topical diſeaſe, yielding little to internal remedies, but chiefly to thoſe applied to the part, as bathing, *&c.* As diuretic and diaphoretic, *Cantharides* have been ſuppoſed pectoral. The only caſe of this kind, in which I know they have been tried, is the Chin-cough, in which Dr. Burton propoſed them. As in the ſame compoſition was joined the Bark and Camphire to correct the *Cantharides*, I eaſily ſaw the Bark was the ſubſtance on whoſe virtue the medicine depended, and therefore uſed it alone. Other practitioners of my acquaintance took the preſcription as it ſtood, and found themſelves expoſed to all the inconveniences of *Cantharides*, without obtaining any other good effect than what was got by the Bark alone. Theſe, then, are the virtues of *Cantharides*, which you ſee are very precarious. As to their effects on the ſkin, we muſt take notice of them when we come to other ſubſtances which poſſeſs the ſame property.

As to the manner of exhibiting *Cantharides*, ſeveral doubts have ariſen, which ſeem ſtill to remain. As to the antient opinion, of the ſeveral parts of the fly being mutual antidotes, that I diſregard, and cannot at preſent decide. A more important diſquiſition is, to determine whether they ought to be given in ſubſtance or ſolution. In ſubſtance they may poſſibly be given in larger quantity, be gradually extracted, and gradually (and perhaps more ſucceſsfully) diffuſed over the ſyſtem. On the other hand, they are ſo eaſily extracted, that we cannot truſt much to this; and poſſibly the common method of giving them in ſolution anſwers better. For the watery or ſpirituous menſtruum anſwers equally well. In what ſubſtance, whether reſinous or gummy, their virtues conſiſt, is not decided; neither, indeed, is it accurately of any other animal or vegetable ſubſtance; neither is it known whether ſolution does not decompound them

them. With regard to all, the doſe is undetermined. This muſt depend on the ſtate of the body, on the greater quantity of mucus in the kidney, the quantity of urine naturally ſecreted, or at the particular time in which *Cantharides* are given. We ſhould begin with ſmall doſes, as five drops, *&c.* and increaſe them, till once they affect the urinary paſſages. The ſimple London Tincture is preferable to the Edinburgh, in which, indeed, the ſubſtances added agree with the intention, but in the preſent form cannot be given in ſuch quantity as to have any effect.

MILLEPEDES.

Theſe inſects ſeem to contain a ſtimulus of the ſame undetermined nature as *Cantharides*, to which they are vaſtly inferior in power. For their aſcribed virtues I refer you to writers. I have ſeen them, for ſufficiently long time, exhibited in the *Chloroſis* and *Scrophula*, but was never able to perceive their ſalutary conſequence. Senſible effects they had none at all.

COCCINELLA.

Theſe inſects are likely to continue of importance in dying. In medicine they have no remarkable qualities. They have been called diaphoretic and ſudorific, but very large doſes are required to produce theſe effects. They are only employed for colouring our *formulæ*.

We have now finiſhed our liſt of particular Stimulants, and come to the general titles added at the end.

1. NUTRIENTIA, as STIMULANTS.

Whatever increaſes motion may be conſidered as ſtimulant. Theſe, as adding ſtrength to the ſolids, increaſe their oſcillations, and more as increaſing the circulating fluids, and conſequently the tenſion. But their chief effects, as ſtimulant, is in their action on the ſtomach. In the hypochondriac, hyſteric, arthritic, nephritic

diſeaſes, &c. ſuch Stimuli are often neceſſary; in the hæmorrhagic, feveriſh, &c. ſuch are hurtful.

2. ASTRINGENTS as STIMULANTS.

I have formerly explained the notion of theſe, as Tonics, not ſo much inducing contraction, but increaſing the firmneſs and tenſion of the part. This will give a briſker action to the veſſels in propelling of the fluids, in overcoming reſiſtance in their way, and reſolving obſtructions. We find all this effected from the moſt ſimple Aſtringents; but a queſtion ariſes, whether the Aſtringent and Aromatic joined would not be more uſeful? I imagine, where the ſyſtem is not affected with Fever, it would. But there are caſes where the Aromatic and Aſtringent would be hurtful, *e. g.* in Vernal Intermittents there is often joined an inflammatory diatheſis. Here it may be doubted whether the Peruvian Bark, which joins together the Aromatic Bitter and Aſtringent, ſhould be exhibited. It ſhould be examined whether the ſimple Aſtringents would not be preferable. Such ſubtilties do no harm, provided we are not too much addicted to them in practice.

3. SEDATIVES as STIMULANTS.

Theſe are pretty univerſally, in their firſt operation, ſtimulant, and very often their ſtimulant qualities affect the action of the heart and veſſels.

4. ANTISPASMODICS as STIMULANTS.

The ſame may be ſaid with regard to theſe, being in their firſt operation ſtimulant; and a queſtion will afterwards occur, whether as Antiſpaſmodics, they do not act as Stimulants? As ſuch, many of them have been ſet down in the liſt of Stimulants.

5. ACIDS as STIMULANTS.

Though the effects of theſe be ſedative, yet they, like other Sedatives, are probably ſtimulant in their firſt operation. With more confidence have I marked

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6. ALKALINES as STIMULANTS.

Which, in every reſpect, are ſtimulant, but not to be conſidered in that view alone.

7. NEUTRALS as STIMULANTS.

Theſe are more obviouſly ſtimulant than Acids, but are attended with the ſame ſedative power.

SEDATIVA.

Sedatives are ſuch ſubſtances as diminiſh motions in the ſyſtem, and the force of the moving power. There is a diſtinction between theſe two, which is not eaſy to be made, ſeeing we ſuppoſe the laſt always to take place. Sedatives may either diminiſh motion in a part, or in the whole of the ſyſtem. In this view, blood-letting is a Sedative, as taking off tenſion; but at preſent I am only to conſider ſuch Sedatives as act particularly upon our nervous power, which can, by medicines, have its mobility entirely deſtroyed. Their operation on the nervous ſyſtem is not eaſy to determine, and as to their ultimate effect, I ſhall not endeavour to explain it. We know very little of the nervous power, having nothing analagous to it in nature, at leaſt nothing exhibiting analogous effects; for though the powers of the ſenſitive plant ſeem ſomewhat of the ſame nature, yet they give us no analogy with regard to the operation of medicines. However, by enquiring into this ſubject, we may diſcover ſome laws of the nervous ſyſtem, and diſcuſs ſome queſtions which have ariſen on this ſubject.

The firſt queſtion we ſhall take notice of is, Whether the action of Sedatives be mediate or immediate? From my definition, you will ſee I have aſſumed the laſt, but others are of a different opinion. It is commonly ſuppoſed, that the motion of the ſeveral parts of the body depend on an influx derived from the *Senſorium*. This once being given, we can eaſily ſuppoſe, that when the blood is rari-

fied, and diſtending the veſſels of the brain, it may compreſs the origin of the nerves, and impede the influx of the nervous power. Hence ſome have imagined, that Sedatives act by rarifying the blood. Others again have adopted a contrary opinion, *viz.* that Sedatives act by inducing a coagulation or viſcoſity in the blood, whence the ſecretion in the brain is deſtroyed. We may diſcuſs both theſe opinions together; 1. We conclude Sedatives do not act mediately, from the ſmallneſs of the doſe required to produce their effect, no medicine in ſuch ſmall quantity acting on our fluids, except in the way of a ferment. 2. Sedatives act after the circulation is taken away, and Dr. Whytt has ſhown, that after the heart is taken out, Opium has the ſame effect as before, in ſtopping the motion of the ſyſtem, which baniſhes altogether the notion of Sedatives acting on the blood. 3. Farther, the quick operation of ſome poiſons ſhews, that medicines, confined to the ſtomach, can act on the nervous power, and be extended over the ſyſtem, without any abſorption into the blood. I need not here mention experiments where theſe effects have enſued, and the medicine been found to conſtrict both its orifices. Whether the effects on the nervous ſyſtem does not produce changes in the fluids, I ſhall not deny. It is that probably which has given riſe to the miſtake.

The immediate action of Sedatives on the nervous power being proved, we proceed to a ſecond queſtion, *viz.* Whether Sedatives act on the nerves to which they are applied, or whether more directly on the *Senſorium commune?* Although we acknowledge a *Senſorium commune*, or prime mover, yet I think it is ſufficiently proved, that the nervous power is preſent in every part of the animal body during life; and that, independent of any new afflux, a motion may be excited; and therefore Sedatives act primarily on the part to which they are applied. There are enough of experiments to ſhow, that the heart, ſeparated from the body, retains its mobility for ſome time after the ſeparation, will even palpitate of itſelf, can have its motion renewed by Stimuli, and its mobility deſtroyed by Sedatives. It is probable, then, the Sedatives act on the part to which they are

applied,

applied, and thence propagate their effects to other parts of the nervous ſyſtem, moſt eaſily to the *Senſorium commune*. It has been aſked, whether Sedatives act on the Stomach? There is no doubt of it; but theſe effects appear in thoſe parts which conſent moſt with the ſtomach, and moſt eaſily in the common origin.

Sedatives, acting on the *Senſorium commune*, exert their power in two ways; 1. In deſtroying the mobility of the nervous fluid there, and ſo deſtroying its afflux to the reſt of the ſyſtem; 2. By deſtroying the mobility in the extreme parts, and ſo making a reſiſtance to the impulſe from the *Senſorium commune*, and conſequently making it incapable to receive impreſſion. I can ſee inſtances where it is proper to make this diſtinction. Thus I think cold undoubtedly acts on the extreme nerves, deſtroys the mobility in theſe, and at laſt ſhuts up the *Senſorium commune* itſelf.

In order to the univerſal action of Sedatives in the ſyſtem, their effects muſt be exerted in the *Senſorium commune*. But here ſuch effects are found to be very unequal, the reaſon of which we muſt now endeavour to explain. This difference of effect ſeems to be varied, 1. According to the proximity of the part; 2. According to the Stimulus to which it is expoſed; 3. According to the habit induced.

1. According to the diſtance from the *Senſorium commune*. The effect of Sedatives, in large doſes, very often appears in palſy of the lower extremities. Theſe, in the experiments on Opium, were found the firſt to come on, and the laſt to diſappear *. We know

* The connexion of this ſentence with the foregoing ſeems not very evident, and, indeed, the reaſoning of the whole paragraph obſcure. Upon a compariſon with different copies, this ſeems to be the meaning: "The nervous power is, "*cæteris paribus*, weakeſt in thoſe parts which are moſt diſtant from the *Senſorium* "*commune*. Hence, whenever any cauſe operates on the *Senſorium* in ſuch a "manner as to diminiſh its influence on the reſt of the body, the effects will appear "moſt evident in the extremities, as being the parts which, on account of their "diſtance, have the ſlighteſt connexion with it. Thus Sedatives ſhow their "action

whether the action be on the *Senſorium commune*, or extremities, by the convulſive motions appearing firſt in the head and extending to the extremities, and *è contra*. To this head of diſtance, I imagine, is to be imputed the effects of Sedatives on the ſecretories, in ſuppreſſing ſecretions; becauſe theſe are ſituated in the extreme veſſels every where, and therefore have their moving power affected ſooner than the heart. The ſecretory ſyſtem to me appears to be a diſtinct portion from that of the heart and veſſels, though contiguous to them, for they are very often differently affected. Nerves enter into the ſecretory organs, which are not continued from thoſe of the veſſels; each particular ſecretory has Stimuli, that act in a particular manner upon it, without affecting the ſyſtem of veſſels: Motion is ſometimes deſtroyed in the ſecretories, without affecting the heart and veſſels: The principal ſtimulus to the ſecretories is that on their excretories, by which not only the excretion, but the ſecretion is encreaſed, without affecting the reſt of the ſyſtem; as in ſucking, or even handling a nurſe's nipples, by which not only will the excretion for the time be encreaſed, but the ſecretion afterwards. Again, in the encreaſed action of the heart and veſſels there is no ſecretion but that of ſweat encreaſed. All theſe diſtinct effects are to be obſerved, and perhaps are depending on the head we are now treating of.

"action by inducing a Palſy of the lower extremities. But the reverſe is true in "the caſe of medicines that excite and encreaſe the action of the *Senſorium* upon "the body. Here the parts ſituated neareſt to the *Senſorium commune* ſooneſt par- "take of its affections. From this conſideration, we are furniſhed with a method "of terminating a diſpute among authors concerning the nature of Convulſions. "It has been a ſubject of controverſy, whether they arrive from affections of the "*Senſorium* only; or from irritations of particular portions of the nervous ſyſtem, "made in the different parts of the body? Both caſes, in my opinion, occur, and "are to be diſtinguiſhed; in the one, by the Convulſion beginning in the ex- "tremities, and gradually ſpreading over the different parts, till they reach the "*Senſorium*; in the other, by the Convulſions beginning in the muſcles of the face, "and extending from thence to the reſt of the body." The reſt of the paragraph is eaſy and clear.

2. The

* 2. The effects of Sedatives, or other medicines acting on the *Senſorium*, depend on the expoſure of the parts to Stimulus. Thus the heart and lungs have their motions entire, while thoſe of the reſt of the ſyſtem are deſtroyed. It has been ſaid, that the nerves of theſe differ, and that in ſuch caſes thoſe of the former are not affected. In Apoplexy this laſt may be ſometimes the caſe; but ſurely in the caſe of ſleep, and of ſedative medicines, no ſuch difference is to be obſerved; and beſides, Dr. Haller has demonſtrated, that the nerves of the animal and vital functions are the ſame, and

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* This paragraph is intended to prove, that the action of Sedatives on any part is always varied in proportion to the degree of Stimulus to which that part is expoſed. This it does pretty clearly; but there are ſeveral things in it, of which I cannot diſcern the connexion with the reſt of the ſubject. I have, therefore, copied this paragraph from another manuſcript, which, though likewiſe obſcure, may, perhaps, ſerve to make it ſomewhat more plain.

"The inequality of the action of Sedatives likewiſe depends upon the degree of "Stimulus to which the parts are expoſed. Thus the heart and lungs are con- "ſtantly expoſed to Stimulus; in conſequence of which their actions are but little "affected by Sedatives operating on the *Senſorium commune*, while thoſe of the reſt "of the ſyſtem are deſtroyed. Authors, indeed, have endeavoured to explain this "effect from the different ſource of the nerves here affected. They tell us, that "the nerves, by which the vital functions are carried on, ariſe from the *Cerebellum*; "while thoſe which govern the other functions are derived immediately from the "Brain. Whether this explanation might not be urged with ſome degree of "plauſibility in the caſe of Apoplexy, is a different queſtion; but ſurely in the "caſe of ſleep, and in the action of Sedatives, no reaſon can be aſſigned, why an "affection of the one can ſubſiſt without that of the other. Add to this, that "Dr. Haller has demonſtrated that the nerves of the vital functions are not, as "was generally ſuppoſed, diſtinct from thoſe of the reſt of the ſyſtem; and you will "hardly require any thing further to perſuade you, that the explanation we have "delivered is by much the more probable, *viz.* that a Stimulus being conſtantly "applied to the vital organs, and only occaſionally to the voluntary ones, the "latter are much more readily and conſiderably affected than the former. "From hence it follows, that whenever we would wiſh to have the full effect of "any ſedative medicine, care ſhould be taken that every thing which acts on the "organs of ſenſe, every thought which affects the involuntary motion, ſhould be "removed. It may be doubted, indeed, how far this laſt is practicable. It has "been alledged that the ſoul always thinks. Not to enter into the ſubtilty of this "diſpute, we may content ourſelves with alledging, that we are not conſcious of "it, at leaſt, in healthful ſleep. Dreams occur only in conſequence of *Stimuli*,

"and

not distinct as was imagined. Much more properly is the continuation of motion in these to be ascribed to the Stimulus to which they are exposed. Accordingly we see, that this effect is not confined to the heart and lungs, but extended to other parts, in proportion to the Stimulus to which they are exposed. Thus any part of the alimentary canal can be brought into action from the Stimulus of the food, and, in short, by such means, any one part can be kept in motion independent of any other part, notwithstanding the action of Sedatives, or of sleep, and all this from the Stimulus applied to it. Thus, in

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" and hence do not so frequently happen in the first part of sleep, as towards the " latter end, when, from a retention of the several secretions, an accumulation takes " place, which gives the Stimulus. Of dreams there subsists all the possible de- " grees that can take place between the system's being perfectly awake, and buried " in the most profound sleep. Of the slightest kind, or those which recede least " from a state of perfect wakefulness, are the *Somnambulantes*. It is remarkable " with what steadiness they perform their actions. The reason of which is, that " their attention is not distracted by a number of objects, as in the time of wake- " fulness; besides, being ignorant of the dangerous situation in which they fre- " quently are, they are wholly divested of fear, and, therefore, pay a calm and " undisturbed attention to the thing about which they happen to be employed.

" But for the most part dreams are extravagantly wild and incoherent. That " they generally bear some conformity to our waking thoughts is acknowledged, " and this happens so frequently, that when we cannot discern it, we ought never- " theless to suppose it. For our thoughts in dreams not depending on the action " of bodies on our external senses, but on internal *Stimuli*, those ideas will gene- " rally be excited, of which there are at that time the strongest impressions in the " mind. These are such as have been the subject of our contemplation the pre- " ceding day, which, being more recent, may be supposed to have their impression " much clearer and stronger than any other. But then they are irregularly " and extravagantly combined; because that power, by which the mind thinks " and judges clearly, requires for its exertion a free and undisturbed *Sensorium*, " which in dreams, being partly free and partly obstructed, occasions this irregu- " larity. This partial obstruction is likewise the cause of the incoherence of our " ideas in delirium, which differs from dreams in this, that here the organs of sense " are awake. We have commonly thought the application of a Stimulus to the " brain sufficient to excite a delirium; but we shall afterwards see, that this will " not do without an obstruction of the *Sensorium*. And accordingly we more " frequently cure a delirium by means that remove the obstruction, than those " that take off the Stimulus." The conformity between the copies is now so great, that I have omitted to copy the rest of this paragraph.

order

order to the action of ſleep, or Sedatives, every thing which acts on the organs of ſenſe, every thought which affects the organs of voluntary motion, muſt be removed. Whether the ſoul always thinks, we cannot determine, at leaſt we are not conſcious of it in healthful ſleep. Dreams always occur in conſequence of ſtimuli applied to particular parts, and hence, in the firſt part of ſleep, they are not ſo apt to occur as in the morning, when accumulation gives ſtimulus. It is no wonder that the mind, occupied during the day, retains the impreſſion of the ſtimuli it received at night, and therefore as we ſee dreams always depending upon ſtimulus, where ſuch cannot be obſerved, we muſt ſuppoſe them. Again, the body can be in any degree of waking; and it is thus we muſt account for the *Somnambulantes*. The ſteadineſs of motion in ſuch caſes depends on the mind not being ſenſible to other impreſſions, or ſtimuli, becauſe there is a total abſence of fear, and therefore a more exact and undiſturbed attention to the action we perform. I ſhould have taken notice of the incoherence of our thoughts in dreams. That aſſociation of ideas on which judgment is formed, depends on the whole *Senſorium* being free. When this, therefore, is at reſt in one part, and awake in another, wildneſs of thought muſt neceſſarily follow. Hence we can underſtand the nature of delirium, in which, in oppoſition to ſleep, the greateſt part of the organs of ſenſe, and the voluntary motions, can be performed, but in which there is an obſtruction in the *Senſorium commune*. The incoherence of ideas in delirium depends upon the ſame cauſe as in ſleep. We have commonly imagined delirium owing to a ſtimulus applied to the brain, but we ſhall afterwards ſee that this will not do without reſiſtance, and accordingly we ſee delirium oftner removed by taking off the reſiſtance, than by taking off the ſtimulus; by Antiſpaſmodics than by blood-letting. It is on the ſtimulus taken off that depends the ceſſation of ſecretion and excretion, for theſe are always excited by the action of ſtimuli on the motion of the neighbouring parts, *&c.* Hence we eaſily ſee how a Salivation is ſtopt by ſleep, and a Diarrhœa from the ſame, taking off the action of the parts, and diminiſhing the flow of the gaſtric and inteſtinal li-

quors, &c. The ſecretion is ſtopt at the ſame time, in ſo far as it depends on the excretion, as it often does.

The excretion of urine depends on the quantity preſſing on the neck of the bladder, and perhaps on the ſtimulus given by it. This bears a curious application. A ſmall ſtone falling into the neck of the bladder, by its irritation not allowing a ſufficient quantity of urine to be collected for dilating the neck of the bladder, hinders its own expulſion; Opium given here cures the complaint, by taking off, for a time, the mind from the irritation, cauſing an accumulation of urine, which, when the effects of the Opium are gone, by dilating the neck of the bladder, &c. expels the ſtone.

3. According to habit are the effects of Sedatives varied. Every motion may become habitual, and then acquire a greater force. From this, as well as the ſtimulus applied, are the lungs, &c. leſs affected than the reſt of the ſyſtem. All periodical motions are difficult to remove, and hence it is that Opium has a much greater effect at bed-time, than at any other hour, and this ſhould give us a caution both in the exhibiting Sedatives and Stimulants, which ſhould always be given at the time when the motion or ceſſation uſually occurred, if we want to induce theſe. It has been thought dangerous to exhibit Opiates during the menſtrual flux, even although ſpaſmodic motions ſhould occur at that time; but I have found that Opiates may very ſafely be given in ſuch caſes, and even as taking off the ſpaſmodic affections I have found them to encreaſe the excretion. However, I muſt own that in ſuch caſes caution is required. Sedatives are often uſeful in preventing the power of morbid habits, and, given before the fit of an Intermittent, I have ſeen them entirely prevent it.

All this explains the inequality of the effects of Sedatives on different parts.

I would alſo conſider what we have ſaid as applying to ſleep.

PAR-

PARTICULAR SEDATIVES.

Particular Sedatives are of various kinds, and we are not acquainted with all of them, and therefore, whether the operation of all is the ſame, or indeed analogous, we ſhall not determine, but obſerve as far as we may.

Oppoſite to Numb. 1. is inſerted *Sedativa ſtrictius dicta.*

At *a* the title *Rhœades.* Moſt of the genera comprehended under this natural order are ſeemingly of the ſame virtues. The only one we employ in medicine for its ſedative powers is the *Papaver*, which I ſet down as a general title. From the ſpontaneous exudations of this is got

OPIUM.

With regard to the different kinds, and extraction of this, I refer you to Dr. Alſton's paper in the Medical Eſſays. Opium is one of the moſt important articles of *Materia Medica*; a medicine of ſuch conſiderable power, that it may prove deleterious, and deſtroy the ſyſtem altogether; and therefore always requiring great caution of exhibition. Not only have the ancients diſputed whether it was cold or hot, but we are at this moment diſputing whether it acts chiefly as a Stimulant, or whether in any caſe it acts directly as a Sedative. (*Vid.* Tralles on Opium.) Theſe doubts probably ariſe from the effects of Opium being mixed, and proving different, according to the doſe, the time of exhibition, and the ſtate of the patient. To throw ſome light upon this ſubject, I ſhall lay before you the phænomena which appear on the exhibition of Opium. This I take to be the moſt difficult part of my taſk, as theſe effects are much diverſified. I ſhall only mention the general appearances, which occur on the exhibition of Opium in a proper doſe, avoiding the ſpecialities which may occur from uſe, *&c.* The effects are theſe.

* First, a frequency of pulſe, after which the body is ſenſibly warmed, generally with a redneſs and fluſhing of the countenance. While theſe effects proceed, a ſerenity of mind enſues, and a lively imagination, which, when it occurs, is almoſt conſtantly of the chearful and pleaſurable kind. To theſe in particular perſons often ſucceed chagrin, irritability, and iraſcibility. By the time that theſe become remarkable, the ſenſes appear imperfect, the imagination falſe, and directly a delirium takes place, and intoxication. The imperfection of the ſenſes proceeds to a total want of ſenſibility, which end in ſtupor and appearance of ſleep. Under this ſleep the pulſe is pretty conſtantly full and frequent, though varying in different perſons. During the ſleep a ſweat takes place, while the other ſecretions are ſenſibly diminiſhed. After this the perſon is awaked, and, if no other ſtimulus takes place, he is attended with a ſenſe of coldneſs and weakneſs. Such is the ſeries of the phænomena, which plainly poſnts out a mixture of Stimulant and Sedative. Theſe, as I ſaid, will vary in different perſons, according to the doſe. From this mixture of the ſtimulant and ſedative properties the whole may be explained. 1. The ſtimulant power is exerted on the heart and larger veſſels, whence the frequency of pulſe, heat, and fluſhing. Next the ſtimulant power is exerted on the *Senſorium commune*. I muſt be content here to ſay, and it may be demonſtrated, that a free flow through the *Senſorium commune* is always attended with ſerenity of mind, in oppoſition to chagrin, and that on the ſame free and equable flow depends the lively, the chearful, and pleaſurable imagination. Theſe are the effects of the ſtimulant power, except ſuch as proceed from it in a ſecondary way. As the ſedative power takes

* Opium given to a healthy perſon, not accuſtomed to it, ſeems to produce no ſuch effects, but is in its primary operation, whether in large or ſmall doſes, directly ſedative. Whether it may have different effects in diſeaſed perſons, or whether it may not be very much diverſified by different diſeaſes, are queſtions that remain to be decided by experience.

place,

place, demonſtrable changes follow, partly ariſing from the encreaſed reſiſtance to the *Senſorium commune*, partly from the encreaſed circulation producing tone and irritation, partly from the imperfect ſenſe, and falſe imagination. It is difficult to give an account of the reaſon of gaiety or ſullenneſs in different perſons, and therefore we ſhall neglect it. The ſedative ſtill mixing with the ſtimulant power, as in other caſes, ſo here produces delirium, which here, beſide the reſiſtance given to the nervous power by the ſedative, the ſtimulant ſtill ſubſiſting, is owing alſo partly to the falſe imagination. More directly owing to the ſedative power are the Stupor and Sleep. During the Sleep, the fullneſs of the pulſe is owing to the accumulation in the larger veſſels, and the laxity induced in them, the frequency of the pulſe to the ſtimulus of the Opium ſtill ſubſiſting unſubdued by the ſedative power. The ſame ſedative power deſtroys the organs of ſenſe, or voluntary motion, as their particular ſtimulus is removed. The ſecretions are diminiſhed from the diſtance, except ſweat, which depends on increaſed circulation.

From the ſedative power prevailing, languor, coldneſs, weakneſs, and head-ach. If the ſtimulant power prevail, recurrence of fever, inflammation and pain, eſpecially if any other ſtimuli are urgent in the ſyſtem.

From what we have ſaid, the effects (good and bad) of Opium may be underſtood. It is eaſy to ſee, that from the ſtimulant power of Opium, it may be an excellent cordial, though at the ſame time, when the ſtimulant power is great, or other ſtimuli ſubſiſt in the ſyſtem, it will produce Fever and Inflammation. On the contrary, by its ſedative power, it may be even uſed to correct motion, except in the heart and veſſels; that is, in fever. As its ſedative power may deſtroy motion entirely, ſo alſo, in particular caſes, we may comprehend how it will induce debility. Theſe are the principles upon which may be underſtood in what manner Opium is hurtful or ſalutary in different diſeaſes. However, I ſhall proceed a little farther in detail.

I chuſe

I chuſe firſt to begin with the anodyne qualities of Opium as tending to explain the reſt. Pain may be conſidered as of three kinds, ariſing from three different cauſes, *viz.* *Diſtenſion*, *Spaſm*, and *Irritation*; from Diſtenſion, more eſpecially of the inflammatory kind, as the Pleuriſy; from Spaſm, more frequently in the alimentary canal, as in Colic; from Irritation, or acrid Stimulants applied, as in Cancers.

1. In pain from inflammatory Diſtenſion. As Opium, in its firſt operation, encreaſes the circulation and impetus of the blood, and even in its laſt accumulates the blood in the larger veſſels, and thus brings a ſtimulus to the heart, it muſt increaſe inflammatory diſtenſion. When given in ſuch a large doſe as to lull the ſenſes, as that its ſedative effects do take place, yet as not removing the inflammatory diſtenſion, or its cauſe, and as producing an accumulation in the larger veſſels, and as thus cauſing a ſeverer return of the pains, it muſt be hurtful in this way alſo. In inflammatory diſeaſes, which depend for their ſolution on a particular excretion, as in the Pleuriſy, Opium, by checking this, prevents the only ſafe and ſalutary criſis of the diſeaſe. From all this it is eaſily underſtood, why Opium is hurtful in inflammatory pains. But there are ſome inflammatory diſeaſes, which, though founded on an inflammatory diatheſis, are apt to turn chronic, as the Rheumatiſm. The acute Rheumatiſm is always an inflammatory diſeaſe; the chronic much oftner than is imagined, and to be cured by the antiphlogiſtic method; ſo that the uſe of Opium, in this diſeaſe, muſt at beſt be doubtful. This will perhaps clear it up. In the abſence of fever, in pain of long ſtanding, and confined to a particular part, Opium may be employed for a temporary relief; but in no one inſtance does it contribute to the cure; nay, even in pains of the longeſt ſtanding, and confined to the moſt ſingle part, it will often be hurtful, by increaſing the irritation; which gives us great caution as to the free uſe of it in ſuch caſes. It may be applied to a particular part with more ſafety. This I imagine to be ſome foundation for the external uſe of the *Cicuta* being found

of

of benefit in chronic Rheumatiſms. There is one inſtance of the external application of Opium having good effect, *viz.* in the Tooth-ach, which is a pain of the rheumatic kind, ſometimes ariſing from inflammatory Diſtenſion, ſometimes from Irritation. In the laſt, it is often uſeful, applied to the nerves of the part. Whether in the pure rheumatic Tooth-ach it ſhould be employed, I am not certain. I have ſeen it of ſervice by deſtroying the nerves of the part. To this head of inflammatory Diſtenſion muſt be referred the uſe of Opium in the *Gout*. The pains occurring in the extremities, in this diſeaſe, are certainly of the inflammatory kind, and therefore Opium may be ſuppoſed to encreaſe theſe, which indeed I have ſeen it do, though in ſo far it is ſafe, as the health of the body depends on this inflammation. Whether we ought to proceed further, and take off the pain, has been much diſputed. The ſounder practitioners, as Sydenham, are juſtly of opinion, that the more violent the pain the ſhorter is its duration, and leſs hurtful to the ſyſtem. If the pain be ſo violent as to overcome all patience, they admit Opium may be given; but then it is very juſtly added, that it is always with danger of the diſeaſe attacking other parts more violently; and I myſelf have ſeen inſtances of it. The rule then is this, that Opium ought not to be employed at the attack of the Gout, nor even at the height of the diſeaſe, except ſome violent ſymptom enſue from mere irritation of pain. When the pains are gone, it may be given, but then, as weakening the tone of the ſtomach, it debilitates that power upon which depends the healthy termination of the Gout. However, I muſt confeſs, that at the end of the diſeaſe, I have often ſeen good effects follow from it, reſtoring the patient ſoon to health, and preventing many an uneaſy night. I have known alſo ſome who obtained the ſame effects from taking to a courſe of ſpirituous liquors immediately after the removal of the pains. I imagine, then, that if the ſtimulant effect of the Opium take place here without much of the ſedative, and at the ſame time as ſweat is promoted, that the Opium will act chiefly as a ſtrengthener.

To

To this head of inflammatory Diſtenſion muſt be referred a ſpecies of it, *viz.* that which occurs in *Suppuration*, an immediate conſequence of Inflammation, but different from the firſt ſtage of it, of which we have ſpoken. The uſe of Opium here may be thought a contradiction to what we have ſaid, but there is certainly a difference between this and Inflammation, although we do not know on what that difference depends. Practice ſhows, that the pains ariſing from Suppuration are not only properly and ſafely allayed, but the Suppuration itſelf promoted by Opium. Certainly upon this is the uſe founded of Opium in the *Small Pox*. Did not experience and our own practice make it very evident, we might know, from that of Sydenham, the uſe of Opium in this diſeaſe; though, indeed, long ago it was employed by the Arabians, in the ſame intention. Some doubts have lately ariſen with regard to Sydenham's practice in this diſeaſe. It has been obſerved, that Opium produced Coſtiveneſs and Fever, diminiſhing the ſecretions, and encreaſing the diſtenſion and determination to the head. With many, theſe doubts have checked the uſe of Opium in the Small-pox altogether. Sydenham takes no precaution to obviate the effects mentioned, and certainly there are ſome caſes where the Coſtiveneſs produced by Opium in the Small-pox has, as I have ſeen, been of advantage. But the better, more ſafe, and now more common practice is, to obviate the Coſtiveneſs by emollient clyſters during the whole ſuppuratory ſtate, and in this way is ſuppuration promoted by the uſe of Opium, and all bad effects avoided in this diſeaſe. Some are ſo fond, on the other hand, of Opium in the Small-pox, that they give it in the purely inflammatory ſtate, in the eruptive Fever; but I have always found it hurtful here, and, in general, I think it ought never to be given before the fifth or ſixth evening after the attack. As to the ſecondary Fever of the Small-pox, it is often inflammatory, and we want to obtain a diarrhœa in it, ſo that here the uſe of Opium is very abſurd. Even where there were the ſtrongeſt ſymptoms of determination to the brain and delirium, or what he improperly calls *Phrenitis*, Sydenham gave doſes of Opium

Opium till he overcame that ſymptom. There are other analogous caſes, where the ſymptoms, which are apt to alarm from the uſe of Opium, are only to be taken off by a larger exhibition of it. We now come,

2. To the uſe of Opium in Pains ariſing from Spaſms. Theſe are moſt effectually in all caſes cured by Opium. At all times there have been diſputes about the virtues of extraordinary medicines. While Hecquet, at Paris, carries the uſe of Opium to an extravagant length; on the other hand, the Stahlians will not admit it at all; ſaying it operates merely as a palliative, without removing the cauſe. Moſt manifeſtly here it has a different effect, not only removing the ſenſe of pain, but alſo its cauſe. Spaſms only ſubſiſt in conſequence of an unequal diſtribution of the nervous power, and therefore are to be cured from Stimulants, or Sedatives exhibited. Of what uſe Opium is in curing Spaſms, appears from its being the only ſucceſsful remedy in thoſe violent ſpaſmodic affections, the *Tetanos* and *Opiſthotonos*, which occur in the warmer climates, as you can ſee from the accounts of Chambers and Hillary. I therefore take it to be a rule, that in all ſpaſmodic affections, and in all pains produced by them, which are not attended with an inflammatory effect, Opium is not only innocent, but neceſſary, both as a Sedative and Stimulant. We ſhall here proceed a little in detail. There is no part ſo liable to ſpaſmodic affections as the alimentary canal, where Opium will not only be uſeful, as acting on the ſyſtem in general, but as here being applied to the morbid part, and therefore is Opium ſo efficacious in all caſes of Colics. Spaſms in the alimentary canal may ariſe from a great variety of cauſes, which ſometimes point out a different method of exhibition; though none of them exclude the uſe of our medicine entirely. To be a little more particular. Spaſms of the inteſtines are ſometimes of the hyſteric kind, ſometimes of the hypochondriac, and frequently paſs for one or other of theſe, when they are properly arthritic. In other caſes they are connected with the hæmorrhoidal flux, either attend-

ing the *Molimen hæmorrhoidæum*, or ariſing in conſequence of hæmorrhoidal ſuppreſſion. In like manner they attend the menſtrual flux, happening at the time of its invaſion, ſubſiſting, or ſuppreſſion. Frequently they are owing to repelled eruptions from the ſurface of the body, frequently to irritations on particular parts, as in the *Nephritis*, where the fit generally extends over the whole of the inteſtines. In ſtones in the biliary duct, Spaſms are often ſuppoſed to proceed from the inteſtines themſelves, but very often they are owing to conſent with the duct *. Often Spaſms ariſe from various irritations, as in the Hernia; often from poiſons of the Saturnine and Arſenical kind, whence the Saturnine Colic; although we might equally diſtinguiſh the Arſenical, or thoſe from irritations in the guts themſelves, in conſequence of worms. Spaſms alſo ariſe from various acrimonies in the *primæ viæ*. The bile is commonly accuſed, though very often Spaſms ariſe from acidities, or crudities, occaſioning its greater flow, and from other irritations, as hardened excrements, *&c.* All theſe are idiopathic. They have been diſtinguiſhed into different kinds, the Bilious Colic, Iliac Paſſion, *Colica Pictonum*, or Dry Belly-ach, *&c.* To all theſe we may add Inflammation. In the whole of theſe, except the laſt, the cure is generally founded on Opium. In the different ſpecies of Colic, varieties ariſe, which give ſomewhat different indications, and point out the joining of other ſubſtances with the Opium; for in ſome caſes it is an abſolute cure, in others only a palliative. In all the caſes mentioned Opium is uſeful, and may be an entire cure, except where Coſtiveneſs is to be overcome, acrid matter or hardened fæces to be evacuated. But this exception is by no means ſo ſtrong as has been imagined, and even where acrid matter and hardened fæces are to be ſubdued, Opium may be employed. Thus in Diarrhœas and Choleras, where the evacuation of the acrid matter is very proper, we muſt not proceed too long with this evacuation, but generally, in ſuch caſes where they are violent, muſt quiet the ſpaſms for ſome

* Spaſms producing pain and anxiety in the inteſtines have been known to proceed from violent venereal inclinations.

time,

time, and defer the evacuation. The caſe is much ſtronger in hardened fæces. Opium certainly produces a ſlow action of the periſtaltic motion, and coſtiveneſs; but this coſtiveneſs in the Ileus, *e. g.* and *Colica Pictonum*, depends upon ſpaſms, without allaying of which the fæces cannot be expelled, and, in effect, we ſee purgatives often do no good without Opium. Nay, there are many inſtances, and I myſelf have ſeen of them, where Opium has procured an evacuation without the purgatives. But the Opium and the purgative may be given at the ſame time, and experience proves, that though it does check the operation of the purgative, it does more than compenſate for that, by taking off the ſpaſms. Now I ſee that practitioners are agreed, that in the Ileus, and Dry Belly-ach, we ought not to wait till the evacuation is procured, but ſhould give the Opium at firſt, and the purgatives directly afterwards, or very often *ſimul et ſemel*. Nothing has miſled us more, than ſuppoſing the Ileus always attended with Inflammation. If, indeed, we can ſee undoubted ſigns of it, the hard frequent pulſe, fixed pains, *&c.* we ſhould ſtop the exhibition of the Opium. But even with theſe we are often deceived, and the ſudden operation in ſuch caſes, and cure produced by the Opium, have evinced, that no Inflammation took place. Often in the Ileus, an *intus* ſuſception ariſes from Spaſms, and Inflammation is only in conſequence of that. If you look into writers, as De Haen and Hillary, you will find the uſe of Opiates well eſtabliſhed in the *Colica Pictonum*. I cannot enter into a detail upon this head, but this general rule may ſuffice, that except in ſo far as Inflammation may check its uſe altogether, or in ſo far as hardened fæces require its exhibition to be deferred, or to be joined with purgatives, there is no caſe in which the Opium is not of ſervice. We ſhall here, however, mention particularly the ſpaſmodic pains of the ſtomach, diſtinct from thoſe of the inteſtines, and often ariſing from acidity, arthritic, hyſteric, and hypochondriac affections. Opium certainly may be employed in theſe, as well as the other caſes, but in the three laſt, as the Diatheſis ſtill remains in the ſyſtem, as Opium is apt to induce a habit, as the fit is often apt to recur, as Opium, by weakening the ſtomach, tends to make

that recurrence more frequent, it is very doubtful whether, in all caſes, ſuch ſpaſmodic affections of the ſtomach ſhould be checked by this remedy. It would be much better, except where the utmoſt violence of pain forces the uſe of Opium, to uſe riding on horſeback. If Opiates are neceſſary, they ſhould be mixed with Antiſpaſmodics, or the ſtimulant Aromatics formerly mentioned, though even with theſe there is the ſame danger of habit and weakening as with the Opium. Here many would proceed by Evacuants, as the fit often ariſes from crudities, and it is on this footing that vomiting has been preſcribed. But there is the ſame objection to Emetics as to Opium, that they do not take off the cauſe; and beſides, I have ſeen the tone of the ſtomach entirely deſtroyed by their uſe. Upon the whole, then, in cardialgic pains, there is no one remedy to be depended upon, or always to be continued, but ſometimes we muſt uſe Evacuants, ſometimes warm Aromatics and Antiſpaſmodics, and in more violent caſes Opiates.

We ſhall now ſay ſomewhat of Spaſms in the other abdominal viſcera. 1. As to Spaſms in the *Uterus*; theſe may be of three kinds, 1. at the menſtrual period; for beſide thoſe mentioned to occur in the alimentary canal at that time, they alſo take place in the Uterus; 2. more manifeſtly they occur at the flow of the *Lochiæ*, in what we call grinding pains; 3. there are caſes where ſpaſmodic pains of the Uterus accompany child-birth. In all theſe Opium is the only effectual remedy. We have already mentioned, under Sedatives in general, that in thoſe pains which precede or accompany the menſtrual flux, Opium not only takes off theſe pains, but, ſo far from checking the ſalutary excretion, promotes the free flow. In the grinding pains Opium is alſo an effectual cure, except where, from any hurt given in delivery, a pain from inflammatory diſtenſion is produced, and then we muſt uſe it with greater caution. With regard to the pains which accompany birth itſelf, theſe are often of the ſpaſmodic kind, and commonly called falſe pains. It is now an eſtabliſhed rule, that Opium takes off theſe, without hindering the ſalutary to enſue, and therefore, in all

Spaſms

Spaſms of the Uterus, is Opium uſeful, except where they are accompanied with inflammation. I forgot to mention, in talking of the grinding pains, that by long continuance they are apt to induce an inflammatory diatheſis, and in ſuch ſtate of them, Opium muſt be exhibited with very great caution. 2. As to the uſe of Opium in Spaſms of the urinary paſſages, the kidneys, ureters, and bladder; pains ariſing from affections of the urinary paſſages are commonly ſuppoſed to proceed from ſtones ſticking in the *tubuli uriniferi*, ureters, or neck of the bladder, and conſequently from inflammatory diſtenſion; but often alſo they proceed from Spaſms, and there is no other method of accounting for the great pain produced by ſmall ſtones in the ureters, ſuch ſtones as would eaſily paſs through them, but from their irritation producing a Spaſm which hinders their paſſage; and hence we muſt account for the effect Opium is found to have in expeding the evacuation of ſand and gravel in nephritic caſes. But conſtantly here we muſt have in our eye this exception, that whenever the pulſe is hard, whenever the perſon is young and plethoric, we muſt uſe bleeding to take off the inflammation, and fomentations to the part. With reſpect to ſmall ſtones at the head of the urethra, we have already ſpoken under Sedatives in general. 3. As to icteric Spaſms from ſtones in the *Ductus choledochus*, I think we frequently ſee caſes where the Spaſms in this duct are the cauſe of obſtruction and regurgitation of the bile. The only perfect cure, in ſuch caſes, is, from the ſtones cauſing the Spaſm being dropt out into the inteſtines. Probably here, as in the caſe of the ureter, the paſſage is more ſlow from the ſpaſmodic affections of the duct, and therefore, in theſe icteric pains, Opium may be of ſervice, by obviating the irritation, dulling the ſenſe of the duct, and allowing its dilatation.

We next come to talk of the uſe of Opium in ſpaſmodic affections of the thorax. Perhaps there may be ſome variety in theſe. The heart itſelf is ſubject to Spaſm, at leaſt to palpitation and ſpaſmodico-convulſive motions, but theſe are not to be cured by opiates. The lungs are, of the thoracic viſcera, moſt frequently ſubject to

Spaſms,

Spaſms, but theſe are often without pain, and perhaps I ſhould have made a head of ſpaſmodic affections without pain; but as they are ſo few, I ſhall comprehend them under this head. Opium, as increaſing the action of the heart, and accelerating the circulation through the lungs, muſt make the breathing more difficult, and more frequent, and therefore the practice with it in aſthmatic caſes, has been ſuppoſed very nice. I think this may be in ſuch caſes a general rule, that in all caſes of pure Spaſm, Opium is uſeful; in all caſes of infarction hurtful. The ſpaſmodic periodic Aſthma is often of a mixed kind, attended with infarction, and terminating by expectoration; ſo that here the Opium would ſeem to do more harm, by hindering the excretion, than good, by relieving the Spaſm. For the method of proceeding here, I would refer you to Sir John Floyer. He, in ſuch caſes, emptied the guts by a glyſter, and the ſtomach by a puke, and then exhibited the Opium. I have followed the ſame practice with ſucceſs, and have found, that though the Opium did, in ſome meaſure, hinder the expectoration, yet that after the Spaſm was taken off by it, the expectoration became more free. Next, as to the uſe of Opium in ſpaſmodic pains of the head. Head-ach is a very frequent ailment, ariſing from a very great variety of cauſes, producing, as I have now found, after endeavouring to diſtinguiſh Head-achs from their cauſes, feelings exactly of the ſame kind. Of theſe Head-achs, ſeveral are not of a ſpaſmodic nature, in which the Opium is hurtful, as thoſe proceeding from inflammatory pains, and, what is more frequent, from rheumatic affections. There is a third kind, the apoplectic, by which I mean a certain ſtate of the ſyſtem, where the blood is apt to be collected in great quantity in the veins of the head, and proves the cauſe of Vertigo, Lethargy, and other ſoporoſe affections, where the Opium is alſo hurtful. In the pure ſpaſmodic Head-achs, which we diſcern by their happening in perſons ſubject to other Spaſms, by their tranſient continuance, and the remedies uſed, Opium is uſeful. Theſe may be conſidered as of two kinds; idiopathic, where the diſeaſe is in the head itſelf; ſympathetic, where it proceeds from connection with other parts, particularly the ſtomach. In the idio-

pathic

pathic ſpaſmodic Head-ach, where we can diſcover it, Opium is uſeful. In the ſympathic, although Emetics there be indicated, yet Opium is alſo uſeful. It is doubted whether the *Clavus hyſtericus* be idiopathic or ſympathic. Certain I am of having often ſeen it affected the head, where no other ſpaſmodic affection was preſent in the ſyſtem, or occurred for a long time afterwards. As purely ſpaſmodic, this affection is to be cured by Opium. To this may be referred the laceration, *&c.* of tendons, producing the Locked Jaw, which is now found to be moſt effectually relieved by Opium. This, perhaps, may rather belong to the head of Irritation, or to Spaſms in the extremities. As to the Spaſms in the extremities, the Opiſthotonos, in which we have already mentioned the good effects of Opium, and referred you to Authors, comprehends them all.

3. We come to the uſe of Opium in pains ariſing from *Irritation.* Theſe are of various kinds, not eaſily to be enumerated. The moſt remarkable are thoſe which attend Cancers and other Ulcers: In all of theſe Opium is a ſafe palliative. Thoſe, who are prejudiced againſt Opium, condemn it as only a palliative, and often bringing back the pain which it palliated with exacerbation; but this is by no means ſo often the caſe as has been imagined. Thus, for inſtance, if an acrid matter be lodged in the *primæ viæ*, if we can check its effects and take off the ſpaſms, in conſequence of the powers of digeſtion, and the afflux of the animal fluids, the acrimony may be corrected, in ſome caſes even evacuated, and ſo the Opium prove more than a palliative. Dr. Young imagines it a hurtful palliative, but even his own facts being given, his reaſoning upon them is not good. But the facts he alledges do not agree with my experience, and I have often ſeen the pain eaſed without any bad conſequences. The virtues of the narcotic Cicuta leads us to ſuppoſe Opium may at leaſt be a ſafe palliative; but I think more may be added; for I find that Opium will even mend the digeſtion in Cancers. In other ulcers, attended with pain, Opium alſo may be exhibited with good effect. Theſe are perhaps the only Irritations we can here ſpeak of. In pains ariſing from fractures,

wounds,

wounds, &c. the temporary relief given by Opiates, as theſe are of inflammatory nature, will be hurtful. I think it even dangerous, as Young adviſes, to exhibit them before operations. But in the caſe of wounds, whether given by art, or deſign, or got by accident, if tending to ſuppuration, and accompanied with pain, I think I have not only ſeen the good effect of Opium in relieving that, but alſo in promoting the ſuppuration itſelf.

The other general head, to which may be referred the caſes in which Opium is employed, is in *præternaturally encreaſed Evacuation*. But before we enter upon that, we ſhall ſpeak of the uſe of Opium in *Fever*. In Intermittent Fevers the uſe of Opium was common and conſtant among the ancients, and we have in this endeavoured to imitate them in modern times. A celebrated writer, in the French Memoirs, has given us an account of his practice with Opium in Intermittents. He was led accidentally to uſe them from the occurrence of an uncommon degree of ſpaſm; and laying down as a rule, I imagine very properly, that the acceſſion was owing to ſpaſm, he ventured to try the effects of Opium againſt it. He gave it about an hour before the acceſſion, which it commonly prevented, and procured a mild ſweat. If given in the time of the acceſſion, he found it was employed with danger, if long before it, that its effects were loſt: He found, that one hour before was what anſwered beſt, and allows only a deviation of a quarter more or leſs. He thinks Intermittents may be diſtinguiſhed according to their degree of acceſſion; in ſome very ſtrong ſpaſmodic motions, rigor, tremor, &c. enſuing, in others theſe being in a much milder degree. It was in the former caſe he found Opium chiefly of ſervice. It has been a frequent practice to exhibit Opium in different caſes. Boerhaave's *Antipyreticum raro fallens* contains two grains of Opium; and, indeed, I imagine it is only from our extraordinary attention to the Bark, that we do not perceive the effects of Opium. We chiefly join it with the Bark to prevent purging, but I think it has alſo a conſiderable effect as antiſpaſmodic. In continued Fevers Opium has been more frequently employed. Trallius has beſtowed

beſtowed much pains on this part of his ſubject; but he appears to me to argue like a man who had already ſettled his point, and to have been prejudiced againſt it; nay, indeed, to overlook, or rather to be totally ignorant of the conſiderations which ſhould determine the queſtion. In inflammatory Fevers Opium is certainly hurtful, but all Fevers are not of this kind, either in their beginning or continuance; and every body allows now the Nervous Fever, or that wherein the *vis vitæ* is apt to ſink; and alſo that Fever depends on acceſſion and repetition. In the caſe of the Nervous Fever Opium may be uſed as a Stimulant, and where the remiſſions are diſtinct, and the acceſſions in conſequence, as a Sedative. In the laſt caſe it may be uſed in the ſame manner as the Bark, and whenever a diſtinct acceſſion comes on, and it is uſeful to throw in the Bark, Opium may be alſo employed. Of theſe things Trallius takes no notice. Wine, I think, is an analogous remedy, Opium being both ſedative and ſtimulant. In the laſt intention it is preferable to Opium, as it can be given in a ſmaller doſe, and alſo from the acid which accompanies it, is leſs inflammatory, and therefore, on this account, in doubtful caſes may be more effectually uſed, as well as from the ſubdivided and gradual manner in which we can exhibit it. But I have ſeen Fevers attended with very ſtrong ſpaſmodic affections, where Camphire, Muſk, *&c.* were uſed, where the Opium was of much more conſequence, and even, as I have ſeen, it removed delirium itſelf; and indeed I believe it may be ſaid univerſally, there is no caſe in which we uſe Wine, where we may not alſo employ Opium.

We now go on to conſider the uſe of Opium in *encreaſed Evacuations.*

The firſt of theſe which I ſhall mention is the Catarrh, an affection in common to the head and breaſt. In general this diſeaſe may be conſidered as an increaſed evacuation of mucus, more commonly in the thin acrid ſtate in which it is then immediately ſecreted. More commonly, however, have we conſidered Catarrh as a diſeaſe

in the membrane of the bronchiæ, and as accompanied with infarction, Opium has been thought of diſadvantage. I think the matter may be compromiſed by theſe general rules; 1ſt, Catarrh may be a recent affection from Cold, and then is more or leſs of an inflammatory and feveriſh nature, and conſequently here Opium may be hurtful and dangerous. But there are many caſes of recent Cold, attended with Cough and Catarrh, where I have ſeen Opium employed with ſafety, very often operating by diaphoreſis or ſweat, which obviated its bad effects. A diſpute has ariſen, whether we ſhould attempt to cure a recent cold by ſweating. I have ſeen ſuch a practice encreaſe it. In general, if there is any degree of Fever, it is not adviſeable to attempt the cure by opiates. 2dly, Where the Catarrh is of long ſtanding, is habitual, not inflammatory, where the ſtillicidium is thin and acrid, Opium is the only effectual remedy, as taking off the ſenſibility of the part, ſtopping the evacuation, and allowing the matter to remain in the follicles till it has obtained its proper conſiſtence and blandneſs. This I conſider as an encreaſed *excretion*. 3dly, In Catarrhs where there is an encreaſed *ſecretion*, and a great deal of groſs mucus, ſeemingly ariſing from a greater quantity of the fluids, which furniſh this mucous matter, being carried to the lungs, I conſider the diſeaſe as an infarction.

Next the encreaſed Evacuation, in which we ſhall conſider the effects of Opium, is Vomiting. This might have been referred to the head of Spaſm, but as there is an appearance of Evacuation, it is indifferent whether we conſider it here or there. With regard to the uſe of Opium in Vomitings, the practice is difficult, as they may ariſe from ſuch a prodigious variety of cauſes. When Vomitings ariſe from acrid matters taken into the ſtomach, they muſt be cured by their expulſion. Thus it would be very abſurd to check the effects of poiſons ſwallowed by the exhibition of Opium: But when the Vomiting proceeds from acrid matter generated in the ſtomach itſelf, acting as a leaven, and changing into its nature the other juices poured into that organ; when the Vomiting has been drawn out to a great length and proceeds to debilitating, it may be quieted by Opium.

Opium. Nay, perhaps by this means the matter may be thrown into the inteſtines, there corrected by a greater afflux of fluids, and by means of a glyſter evacuated. Thus in Cholera, where the ſtomach has been cleared, and the vomiting proceeds from a greater flow of bile cauſed by an inverted motion of the guts, Opium may be uſeful, by taking off the inverted motion. Where the vomiting proceeds from inflammation or ſcirrhoſity, Opium is uſeleſs, in many ſuch caſes hurtful. Where vomiting is a ſympathetic affection, from ſpaſms of the alimentary canal communicated to the ſtomach, Opium is univerſally uſeful. There is one caſe in which it is very doubtful, *viz.* in that Vomiting which occurs in the cold fit of Intermittent Fevers. Some check this by Opium, and ſome mix it with their ſaline draughts. If the ſaline draught could be confined to the ſtomach, then perhaps Opium might be uſeful in determining to the ſurface. But in moſt caſes this Vomiting is a ſalutary effort of Nature to throw off the offending cauſe, and to determine to the ſurface, and therefore ought not to be checked by Opium.

We are now to talk of encreaſed Evacuations in the lower belly. In Diarrhœa and Dyſentery the uſe of Opium is very common, but the particular circumſtances in which it ought to be exhibited are not ſo well aſcertained. Where Dyſentery is recent, accompanied with Fever, and perhaps inflammatory diatheſis, and, in ſhort, wherever one would think of bleeding in this diſeaſe, Opium ſhould not be employed. Some are for conſidering Dyſentery always as an inflammatory diſeaſe; but I imagine this is but ſeldom the caſe, and where it is not, Opium may be employed. Diſputes have ariſen on this ſubject, and it has been ſaid, as giving occaſion to the retention of the acrid matter, and hardened fæces, Opium ſhould not be uſed. To be ſure the whole of the cure muſt not be truſted to it. Dr. Young's arguments, who thinks he has treated this part of his ſubject very fully, amounts to no more than what we have ſaid of the retention of the acrid matter. But Opium may certainly be compatible with the Eva-

cuation of these hardened fæces, and acrid matter. Often, as in the *Ileus* and *Colica Pictonum*, they owe their rise to Spasms, and can only be removed by Opiates. As the giving Opium with purgatives has been allowed by Dr. Young himself, I think the whole of the dispute ought to have been superseded, and a general rule been established, that Opium universally may be used, where it does not interfere with the Evacuation. Opium is not to be considered as astringent; it only diminishes the moving powers in the vessels for a time, leaving the system as lax as before.

We shall next consider the effects of Opium in Evacuations of Blood, natural or morbid. The only natural Evacuation of Blood is the menstrual. The encrease of this may be considered as of three different kinds. The first, which rarely happens, is attended with an inflammatory diathesis; the second depending upon Spasms; the third on debility, which is seldom free from the second. In the two last, Opium is a safe and useful remedy, but not to be depended upon for a cure; for the astringency of Opium is only temporary, and it is given only as a Palliative, till other Astringents can be used, to give tone to the parts. Nay, I would advise against the too frequent use of it, as it is apt to bring on an inflammatory diathesis. In too great flow of the *Lochiæ* Opium is very proper, for this encreasing flux is often attended with spasmodic affections, and debility; but here we must constantly have in our view the inflammatory diathesis, apt to be induced in child-birth. There is a third case analogous to these, *viz.* where pregnant women are threatened with abortion, and already a flow of blood has taken place. There is no case in which the use of Opium is more difficult than this. I have seen it frequently prevented, frequently brought on by bleeding. I dare not confine the bleeding to the plethoric, for even in these has it produced abortion, and therefore I am not ready to mark out the cases where one or the other is proper. Where the disease arises from any cause of inflammatory nature, I would admit that Bleeding is the remedy, and Opium is hurtful. Again, where the flux depends

on

on hyſteric affections, and there is no inflammation, Bleeding is hurtful, and Opium is the cure. Where the abortion is owing to habit, as every body knows it may, Opium is always uſeful, and I have ſeen inſtances, where by the uſe of it women retained children, of which they would otherwiſe have miſcarried. The uſe of Opium in pregnant women is doubtful. Where pregnancy is attended with ſpaſmodic affections of the ſtomach, *&c.* Opium would be a palliative, but ſtill it is doubtful if it ought to be uſed. In every pregnant woman, there is an inflammatory diatheſis, and the blood covered with a cruſt. Though on other occaſions, I have uſed this as an argument againſt that cruſt being always a morbid appearance, as in the moſt healthy women it occurred, yet here I muſt own, that it gives a ſuſpicion of the inflammatory ſtate, and therefore ſhould make us cautious in the uſe of Opium. Theſe are the natural Evacuations of Blood. What comes neareſt to a natural evacuation is the hæmorrhoidal. I would not allow, with the Stahlians, that the hæmorrhoidal flux is always a natural evacuation, but frequently, from various accidents, it becomes a habit, and a law to the ſyſtem, and neceſſary for health. From the nature of the diſeaſe, being a diſtenſion and collection of blood in the cellular membrane of the *rectum*, often depending on a laxity of the veſſels, Opium may be uſeful; but as coſtiveneſs is commonly the cauſe, which Opium would encreaſe, it will as frequently be hurtful in this diſeaſe. It is only in great urgency, and when the diſeaſe is attended with Spaſms in the alimentary canal, that the exhibition of Opium ſhould be attempted. In morbid hæmorrhages, there is no doubt but that the ſedative power of Opium will relieve their exceſs; but the hæmorrhagic diatheſis is very near a-kin to the inflammatory, and whatever accumulates the fluids in the larger veſſels muſt be hurtful in hæmorrhages, and accordingly we ſee that when they are repreſſed by Opium, it is not uncommon to ſee them return with greater violence. The ancients employed Opium and Hyoſcyamus in ſpitting of blood, and ſome lately have renewed the practice, though ſeemingly with a good, yet, in my opinion, always with a doubtful effect. Moſt

of

of the ſpittings of blood are attended or followed with an inflammatory diatheſis, and end in *phthiſis pulmonalis*, which is likewiſe of the ſame nature, and there the Opium is hurtful. But there are caſes of ſpitting of blood, ſubſiſting for forty years, where there is no tendency to phthiſis, or tubercles, and where the diſeaſe has ariſen merely from an accidental rupture of the veſſel, and afterwards kept up by laxity and habit. It is in ſuch caſes only in which Opium can be exhibited with any ſafety.

Theſe are the caſes in which Opium is hurtful, or of advantage. Poſſibly ſeveral may be omitted. At preſent I recollect one, *viz.* the uſe of Opium in the Meaſles. The Meaſles, from being an eruptory diſeaſe, and being frequently joined with the Small Pox in Treatiſes of Phyſic, has probably had the uſe of Opium transferred to it, from its being employed in the other. But in the Meaſles it ought not to be exhibited on the ſame footing as in the Small Pox, for the Meaſles is not a ſuppuratory diſeaſe, and it was as a Suppuratory that I ſaid Opium acted in the Small Pox. The Meaſles are ſeldom dangerous in their firſt attack, but afterwards are ſo, from their inducing more or leſs of an inflammatory peripneumonic ſtate, and therefore Opium muſt be uſed in this diſeaſe with caution. A ſymptom frequently indicates it, *viz.* the Cough which occurs, with thin acrid diſtillation without much mucus, and I imagine in the beginning it may be employed, but ſhall not determine whether it would obviate the diſeaſe in the lungs. When the eruption is over, and the peripneumonic ſymptoms are coming on, it is dangerous to give Opium. There is another ſymptom, the diarrhœa, to wit, which indicates Opium. Nothing better ſhews the inflammatory ſtate in the Meaſles than the obſervation of Sydenham, that the diarrhœa occurring here is beſt removed by bleeding.

As to the pharmaceutical treatment of Opium, little need be ſaid about it. Its virtues may be extracted equally by every menſtruum. All the preparations of it are only made with the inten-

intention of weakening it, which may be much more effectually done by leſſening the doſe. The great labour beſtowed on this head ſeems entirely uſeleſs.

Oppoſite to *b* ſtands the title *Umbellatæ*. I have mentioned only two genera of the ſame order, the reſt of which may have ſimilar virtues.

CICUTA.

Linnæus applies the term *Cicuta* to the *Cicuta aquatica*, calling this, of which we are ſpeaking, *Conium*. From what we now know of the *Cicuta*, I am apt to ſuſpect we ſhall find ſome uncommon virtues in Parſley and Fennel. Fennel has, in effect, been ſeen to diſcuſs hard Tumors.

Of late the *Cicuta* is ſo famous, that I need give no account of it, but only refer you to Stork's pamphlet. At the end he has drawn up ſome corollaries upon the whole of what he has ſaid. At all times externally applied, the *Cicuta* has been known for reſolving ſcirrhous tumors. We now learn it may be applied internally for the ſame purpoſe. We imagined that medicines internally given, could not reach the veſſels of the affected parts, and I believe we were right in that ſuppoſition; for the *Cicuta* probably acts on the nervous power, and communicates its action to the moſt moving fibre of the body. I leave you then to judge whether it be from encreaſing the action of the veſſels, or by diſſolving the concreted fluids, that the *Cicuta*'s action is exerted.

We cannot admit ſome of the corollaries at the end of Dr. Stork's pamphlet. It is aſſerted the *Cicuta* has no ſenſible effects. This contradicts our practice. I have known twelve caſes where vertigo was produced, one particularly where the vertigo, and ſome kinds of convulſion was produced, and although the patient took, at length, forty grains for a doſe, yet did the *Cicuta* not cure his diſeaſe; and, what was extraordinary, even externally applied had the

the ſame conſequences mentioned. Hence it cannot be ſo ſafe to every age and ſex as he mentions. Beſides, as to the ſenſible evacuations, I myſelf have ſeen the *Cicuta* move the inteſtines; have good authority for its acting by urine and ſweat, but do not indeed know if its effects were different when it had or had not (which was more commonly the caſe) any ſenſible evacuation produced by it. Stork recommends the *Cicuta* in the Struma, which is a very vague term, and has been applied to every ſwelling of the conglobate glands. This does not apply to our Scrophula, which is not a topical diſeaſe, but diffuſed over the whole of the lymphatic ſyſtem, and occurring more frequently in the young than old. The firſt, ſecond, ninth, tenth, and thirteenth caſes are all different from our Scrophula, except the tenth, which comes neareſt to it; and in the other the diſeaſe is in old perſons, and much farther extended than our Scrophula, in which we have commonly employed the *Cicuta*, and commonly indeed failed, from the reaſons given.

From having lately had recommended in Cancers a remedy which failed, I imagine we are too apt to diſtruſt the *Cicuta*. I have ſeen two deſperate caſes, one of a Cancer in the lip, and another in the breaſt, which are nearly cured by it; and have had accounts of others from perſons of veracity. For my part, I have no manner of doubt in believing in the ſucceſs of the Vienna practice. Many circumſtances may miſlead us in judging of the virtues of the *Cicuta*. We may have applied it to diſeaſes to which it is not ſuited, as in the *Scrophula* or Cancers, and *Scirrhi*, which ariſe from cauſes not to be removed by it; we may have failed from uſing an improper medicine, *i. e.* taken at a wrong time of the year, or a wrong prepared extract; from uſing it for too ſhort a time, (for in many of Stork's caſes a very long time was required;) from too gradual an application perhaps of the doſe, by which, when we have attained a large one, we loſe its effects; and ſeveral other cauſes to which we do not attend. In many of the caſes, both here and at London, the medicine has procured a good ſuppuration, but gone no further, which I imagine to be owing to the ſmall doſe having loſt its effects

by

by habit. We ſhould therefore interrupt the exhibition or encreaſe the doſe.

CICUTA AQUATICA.

Since ſuch virtues are found in the common *Cicuta*, we may infer the ſame to the *Cicuta aquatica*, which was the common ſuppuratory *Cicuta* of the ancients. Poiſon and medicine only differ in degree, and I imagine we are very raſh in rejecting ſubſtances, from ſuſpicion of the danger. I had ſet this down in order, with that of ſeveral others, to give you the hiſtory of it as a poiſon, but that I find our time obliges us to neglect. As poiſonous, this plant belongs to the next ſet, which is a natural order, called by Linnæus

LURIDÆ,

which he imagines to be poiſonous, from their malignant aſpect; but the botanical analogy likewiſe takes place, for all of the ſame claſs have the ſame virtues. Of the ſix mentioned, the virtues are much the ſame. Poſſibly there may be ſome variety, and indeed experiments ſeem to ſhow it. We ſhall only remark upon three of them.

BELLADONNA, or SOLANUM LETHALE, &c.

This is marked out as a poiſon, which does not exclude it as a medicine. Geſner tells us, that the expreſſed juice of the berries, made into a ſyrup, is a ſafe and uſeful anodyne; and by a peaſant in Utland, infuſed in wine, it was found to be employed as a cure for the Dyſentery. Another author, Regnerus, tells us of its ſucceſs in cancerous caſes, and theſe are the beſt teſtimonies of its virtues, which indeed, from analogy, we ſhould readily expect. Lamberkin abroad, and Gataker at home, have given us inſtances of its ſucceſs; and if well atteſted inſtances are brought of its ſucceſs, although it has failed both here and at London, we may judge of it in the ſame manner as of the *Cicuta*. From my own experience I can ſay

ſomewhat of it. A woman, born of a mother who died of a Cancer, and her ſon, had, the one a Cancer in the Lip, the other on the Cheek near the angle of the eye. The ſon, who had the Cancer in the Lip, got the *Belladonna*, began with half a grain, and by degrees had the doſe encreaſed to twelve grains of the dry herb, which produced a good pus in the wound, prevented its ſpreading, and healed it up, all to a ſmall ſpeck covered with a ſcab. The medicine had produced a heat, and afterwards a conſtriction of the fauces, from which it was given up, but the Cancer afterwards breaking out, recourſe was again had to the *Belladonna*, and with the ſame good effect as before, but with the ſame conſtriction of the fauces. After this the lad was ſeized with a vomiting of blood and died. This vomiting of blood I impute to the *Belladonna*. In the mother the Cancer was of fifteen years ſtanding, and began a ſmall eroſion, which gradually extended to her eye: She uſed the *Belladonna* very cautiouſly, and ſoon found relief from the pain, found the farther extent of the ſore prevented, good pus formed, and at laſt a contraction of the ſore. In this ſtate has ſhe continued for theſe four years. Whenever the ſore again renews, ſhe has recourſe again to the medicine, which effectually prevents its extending; nay, ſometimes ſhe goes ſo far as to make it contract a little, but never ſo much as to heal it up entirely.

There is a caſe mentioned in Juncker's *Conſpectus Therapeiæ*, of what he calls the wonderful effects of the *Belladonna* in curing Cancers, but he alſo gives us another inſtance in which it failed. Theſe, and the caſes I have mentioned, only ſhow that the *Belladonna* is not fit for all caſes of Scirrhus and Cancers, which is alſo true of the *Cicuta*; but this does not hinder either the one or the other from being a valuable remedy.

HYOSCYAMUS, HENBANE.

This was employed by the ancients as narcotic, in the ſame manner as Opium, and by ſome has been ſaid to be more powerful.

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It is ſaid always to produce a quarrelſome humour. Whether this proceeds from the management of the doſe, I ſhall not determine. It has the other common qualities of the *Luridæ*. Several of the Anodynes of the ancients have gone out of uſe. We are obliged to the courage of Paracelſus for reſtoring the uſe of Opium. The *Hyoſcyamus* has been employed, by ſome of the moderns, in Catarrhs and Hæmorrhages, and I believe with the ſame virtues in ſuch caſes as the Opium. The ſame obſervations apply to the *Mandragora*, *Solanum*, and *Stramonium*.

NICOTIANA, TOBACCO.

The anodyne and narcotic virtues are here joined with a large proportion of the Stimulant. Every body knows its errhine power, its power of ſtimulating the ſtomach and inteſtines, and internal parts of the ſyſtem. Its errhine and ſalivatory powers are too frequently employed. I take the uſe of it to be very uncertain. As errhine, its effects are loſt by habit, though it is ſuppoſed to continue to produce the excretion of mucus, which, as it is an excrement, is not of much harm. As ſalivatory, it does not increaſe the ſecretion, and takes off and expends a fluid neceſſary to the ſyſtem, palls the appetite, hurts digeſtion, *&c.* The ſame is to be ſaid of the uſe of it in fumes. Its quality as emetic is valued by ſome, but I know no advantage it has above other acrids. In the Dyſentery, Opium is conjoined with purgatives. The *Nicotiana* poſſeſſes in itſelf both the ſtimulant and ſedative qualities, and by Diemerbrock has been employed, with advantage, in the diſeaſe of which we are ſpeaking. Given by the mouth, it is ſo liable to prove emetic, that it is very inconveniently employed as a purgative. Given in a glyſter it anſwers much better. Its doſe may be from ʒſs. to ʒj. in infuſion. It is as certain a remedy in all caſes where glyſters are wanted, as any I know, only if the doſe be large, it is apt to produce weakneſs at ſtomach, vomiting, and tremors and ſpaſms over the whole body; however, properly exhibited, it is of advantage in many caſes. Du Haen has found the fumes of it very efficacious in

the ſtrangulated *Hernia*, *Colica Pictonum*, and *Ileus*; and nothing hinders my employing it, but the want of a proper apparatus, which has been endeavoured to be ſupplied.

From the effect of the fumes, we ſee the active parts may, in great meaſure, be volatilized. Hence we can obtain a milder preparation by boiling. It has been long uſed in ſyrup. When the acrimony is taken off by boiling, it may be exhibited with more confidence internally, though its purgative effects are not, by this means, taken off; but here it may be introduced into the ſyſtem, and prove diuretic and pectoral. If in this ſtate it retain its narcotic and ſtimulant effects, it may anſwer better than Opium, or ſimple Stimulants. Externally, like the *Cicuta*, it has been employed for reſolving Scirrhuſſes; and, made into ointment, has been employed as a detergent, and digeſtive in Ulcers. I do not know whether it has been employed in Cancers; applied to freſh wounds, it has proved dangerous, and this gives a caution againſt employing it in open ſores.

MISCELLANEOUS LIST.

LACTUCA.

One ſpecies of this is remarkable for its narcotic virtue. I ſet down this to give you a ſuſpicion of the lacteſcent plants containing ſomewhat of the ſame quality. Its effects in medicine are not aſcertained.

LAURUS.

I intended here to have given the hiſtory of the *Lauro-ceraſus* as a poiſon, but muſt refer you to the Philoſophical Tranſactions, and the experiments of Brown Langriſh upon brutes. His experiments would ſeem to ſhew, that in a moderate doſe it might be employed, but they are not yet ſufficiently numerous to be truſted. He finds it produces conſiderable changes in the blood, but ſuch trials require much caution. But although ſuch change were found, it

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is not owing to its action on the blood itself, but on the system of vessels.

Laurus. This has been long employed in medicine, in bark, leaves, and berries. The kernels resemble those of the Bitter Almond and *Lauro-cerasus*, and on that account have been brought under suspicion. But it is doubtful whether we do not carry this matter too far. Surely the kernels of the black cherry are not of the same qualities with the leaves of the *Lauro-cerasus*. They may contain them in different degrees, and therefore I think it is wrong to reject them. Different parts of the *Laurus* have been employed, as we have said, in medicine, and may still be retained; and I am doubtful whether the Bay-berries, in the *Elixir sacrum*, are properly rejected. While the old composition remained with the Carduus and Bay-berries, I have seen this Elixir cure Intermittents. Their proper use, as carminative, I do not know. Externally, the leaves may be useful. In White Swellings I have used them with success, they in some proving a cure, and in others stopping the progress of the disease.

COFFEE and TEA.

How far these are properly inserted here, I shall not determine. I set them down, in order to give a suspicion of their deleterious qualities. Much dispute has arisen about their virtues. One would imagine frequent experience would long ago have decided such dispute. Perhaps it is that frequent and universal use, which gives occasion to it. Whenever a medicine comes to be in universal use, many of the operations of nature are ascribed to it; as no person is in perfect health, its effects will be varied in proportion as those who use it recede from the standard. He who errs on the side of rigidity, will find relief from warm water; he who errs on the side of laxity, has his laxity increased by it. If such a medicine, as those we talk of are, act on the nervous system, its effects will be destroyed by habit; as rendered palatable, no good account can be had of its effects; if good, they are magnified; if bad, they are concealed; nay,

nay, we are apt not only to deceive others, but ourſelves, and to fancy thoſe qualities we wiſh to exiſt. All theſe circumſtances take place with regard to Coffee and Tea. Their effects are, in my opinion, very much mixed, depending on the warm water. All this has ſo much weight with me, that I cannot ſpeak poſitively on this head. The aſſiſting digeſtion, relieving the ſtomach from a load of aliment, from crudities, and from head-achs ariſing from them, promoting the ſecretion of the urine, and perhaps of perſpiration, may all fairly be attributed to the warm water. The ſame, alſo, will have the effect of keeping from ſleep. Theſe are the chief of the virtues aſcribed to Tea and Coffee. The weakening the tone of the ſtomach by frequent uſe, weakening the ſyſtem in conſequence, inducing tremors and ſpaſmodic affections, are the effects of the Tea itſelf, though in ſome meaſure alſo of the warm water. This applies to Tea chiefly. I have a ſtomach very ſenſible, which I have found to be hurt by Tea, which I attributed to the warm water, but having uſed ſome indigenous plants with the ſame heat of water, I found no harm enſue, and this I have repeated above fifty times. I continue now to uſe Tea, but without the ſame effect as before from habit, and alſo from my advance in life. Many others I know, who have had the ſame experience. The ſame effects are not ſo remarkable in Coffee; but ſtill experience ſhews them to be of the ſame nature. From the uſe of it I have always an arthritic affection of my ſtomach but no tremor. Farther, I can ſupport what I have ſaid on Tea, from botanical analogy, for it belongs to an order of plants of the narcotic kind, *viz.* the *Coadunatæ*. Theſe narcotic effects are ſo remarkable, that the people of Aſia do not uſe it till it is a year old. As we have it, it is always of that age, and has its acrimony in ſome meaſure diſſipated; but as it has an emetic quality, it ſhews that it is not all gone.

After all, I think we may conclude, that Coffee and Tea, however their effects be varied by habit, or particular conſtitutions, are here properly placed as Sedatives, as weakening the tone of the ſyſtem, and diminiſhing the force of the nervous power.

CROCUS,

CROCUS, SAFFRON.

This is properly a ſubſtance *ſui generis*, being the only inſtance of the ſtigmata of flowers employed in medicine. Poſſibly ſome curious virtues might be found in employing this part, as it is of a peculiar acrimony. Saffron has been long famous among Phyſicians, but its effects are not aſcertained. In ſmall doſes it has no effect; nay even in the largeſt given by *Materia Medica* writers. I have been attentive in making ſeveral experiments with it, and never found it act, except in very large doſes, (ʒij.) as a general Stimulant. It has been recommended as emmenagogue, and I have ſucceeded with it in that intention. But here there is a fallacy, as the natural evacuation may be brought on in time of the remedy being exhibited; and indeed I have much oftener failed than ſucceeded with it. As to any exhilarating effects, I never perceived them, and as little its anodyne or anti hyſteric. I am ſorry Boerhaave ſhould have thrown away ſo much authority upon this medicine. Indeed he ſeems to have copied what he ſays of it, from writers of no authority at all.

NYMPHÆA,

Is ſet down, becauſe it ſtands in our Diſpenſatory. The London College have very properly left it out, as its properties are not known. It has been ſaid to be anodyne, *&c.* and indeed analogy ſeems to ſupport it, as it is of the ſame natural order with the Poppies.

WINE and ALCOHOL.

I have ſet down theſe here, as I conceive that they have the ſame property as Opium at bottom, and that all that has been ſaid of that will apply to them; with this variation, that Wine is leſs, Alcohol more inflammatory than Opium.

The next thing is the general titles. Theſe may be diſtributed into three or four claſſes, *Acids*, *Aſtringents*, *Neutrals*, *Emollients*, and *Antiſpaſmodics*.

Acids

Acids and Aſtringents, as Sedatives. Acids have undoubtedly the power of deſtroying the mobility of the part to which they are applied. They ſeem too to act as aſtringent, and therefore are conjoined with theſe. Many Aſtringents extend their effects over the ſyſtem, and while they produce contraction, at the ſame time deſtroy the mobility; and it is a frequent remark, that the uſe of Aſtringents or Spaſmodics is followed by an *Atonia.*

Neutrals as Sedatives. Neutrals are refrigerant, but it is uncertain to what to refer their operation. Both Acids and Neutrals are antiſeptic, and by taking off the inteſtine motion of the fluids, take off the ſtimulus from the ſolids.

Emollients may be conſidered as Sedatives; for by relaxing, they take off the activity from the *Solidum vivum.*

Antiſpaſmodics as Sedatives. Theſe are often Sedatives directly, inſomuch that the general term Sedative might often comprehend both; and indeed, in our liſt of Sedatives, many of the Antiſpaſmodics have been mentioned. The diſtinction will be mentioned under the head of Antiſpaſmodics.

ANTISPASMODICS.

With regard to every affection of the nervous power we have been much in the dark, and ſo with regard to our ideas of Spaſms and Antiſpaſmodics. Gaubius thus defines it: *Spaſmus dicitur violenta, invita, inordinata, fibrarum motricium actio.* * Spaſm means

* This ſentence may be better expreſſed thus: "The original word Σπασμος, in "the Greek language, ſignifies no more than *contraction*; and therefore to di-"ſtinguiſh the diſeaſe which now goes under this name, from thoſe contractions "that are the reſult of our own volition, in the definition of it, we add the term "*invita.* This is ſufficient for diſtinguiſhing it in the voluntary organs. But "Spaſm likewiſe occurs in the involuntary organs. We are under a neceſſity, then, "of employing ſome other terms, which may diſtinguiſh the morbid involuntary "contractions from the natural ones, which are the immediate agents by which "life is kept up. For this purpoſe we add the terms *violenta et inordinata.* Thus it—"

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no more than contraction, and therefore *invita et violenta* are added, and *inordinata* to take in what the voluntary organs indicated by *invita*, the action of the vital organs, *i. e.* when that action is not performed regularly from the ſtimulus applied to them. Thus the ordinary ſtimulus to the heart is the venous influx; it is called *inordinata contractio cordis*. All this, however, is not ſufficient. It is a law in the human œconomy, that contraction is always ſucceeded by relaxation. Whenever this contraction continues longer than it ought, a Spaſm takes place. If to his definition, then, Gaubius had added *durable*, it would have been more perfect. But a queſtion here ariſes, *viz.* whether Spaſm is to be conſidered as a ſingle contraction only, continuing longer than it ought, or whether Spaſm is to be conſidered as an inordinate contraction frequently returned? On this Gaubius ſays, *Qui Spaſmum a convulſione diſtinguunt illum vocant continuam, hanc alternantem muſculorum contractionem*, and very properly; for there is certainly a diſtinction between ſpaſm and convulſive motion. Gaubius ſubjoins very well: *Perinde fuerit, num eodem, an diverſis nominibus utere. Uterque enim effectus ad idem genus pertinet, partes eaſdem occupat, ſimileſque et cauſas et differentias agnoſcit, quin et, haud raro, alius in alium tranſit.* Spaſm, then, is the ſingle contraction, convulſive motion the inordinate. If we uſe the word Spaſm, we muſt comprehend under it ſpaſmodic motion, and by Antiſpaſmodic mean ſuch medicines as are ſuited to take off either or both affections.

As to their manner of operation it is difficult to explain. Spaſm may depend either on an extraordinary influx of the nervous power into the part, * or, again, an unequal diſtribution of it. Hence it is ſeen why both Stimulants and Sedatives are Antiſpaſmodics. But beſides the more obvious Stimulants and Sedatives there are others diſtinct from theſe. Stimulants univerſally prove ſo to the ſanguiferous ſyſtem; even the Sedatives have often the ſame pro-

* In another copy, too great mobility, and a weakneſs of the nervous power, are mentioned as the ſecond cauſe of Spaſm, to be remedied by Stimulants.

perty, which is wanting in Antiſpaſmodics. On the other hand, Antiſpaſmodics have no narcotic property, ſo that they are diſtinct medicines from both. We ſhall, however, have occaſion to ſay, that even our Antiſpaſmodics are connected intimately with theſe heads; but this is not yet clear, and moſt of our liſt are antiſpaſmodic, more than in proportion to the ſtimulant or ſedative properties. Antiſpaſmodics are taken from the three kingdoms, and, in general, their virtue ſeems to reſide in an oil; in vegetables, in an eſſential oil; in animals and foſſiles, in ſomewhat analogous.

FOSSILE ANTISPASMODICS.

AMBRAGRISEA.

The real origin of Ambergriſe has been diſputed. Two particulars we know, that it is neither of animal nor vegetable origin, being always found in the ſea, or thrown out upon its ſhores; and that its chemical analyſis affords the ſame principle as *Succinum, viz. Petroleum.* As grateful to the nerves it may be called cephalic and cordial, but this gives no diſtinct idea. Poſſibly it may have the ſame qualities as Muſk, but the analogy is not here perfect, and experiment muſt determine it. Odorous bodies, and almoſt thoſe only, are Antiſpaſmodics; but odour may ſometimes reſide in ſo ſmall a part of the ſubject as to have no effect on the body.

SUCCINUM, AMBER.

This has been employed in medicine; but I believe is not ſoluble in our fluids, nor in any menſtruum out of the body, ſo that it can be given in ſufficient quantity to exert powerful effects. Hence it muſt have no virtues, and, after many experiments, I have found this to be the caſe. The preparations of Amber have been more employed than Amber in ſubſtance. An acid ſalt is got from it, which afterwards is enumerated under the Acids. In its own nature it is not antiſpaſmodic, and any virtue it may have of that kind is owing to its oil. This oil is very much of the ſame nature with

with *Petroleum*, and an oil of the ſame kind is to be procured from pit-coal, and other bituminous ſubſtances, and therefore we may talk of the virtues of foſſile oils at once, except that the fire may alter them, by giving more or leſs of empyreuma and acrimony; but all of them, by proper rectification, may be brought to the ſame degree of purity. We ſhall then talk of them under the general title of

PETROLEUM.

All foſſile oils have been reputed antiſpaſmodic, but are likewiſe very powerful Stimulants, and by this means often unfit for uſe. They have been received as pectoral, and the ſame cautions take place with regard to them, as with regard to other acrids uſed in that intention; for many chronic diſeaſes of the breaſt are of inflammatory nature. Beſides their antiſpaſmodic virtue, the foſſile oils have had aſcribed to them that of emmenagogue. Their uſe in this intention muſt be where there are ſpaſmodic affections of the uterus: But I have often been deceived with them when theſe affections were preſent. They are of ſo much reputation with the women, that they take them unpreſcribed, and I have known caſes where they have been given to procure abortion, but even in very large doſes without the effect, they only diſturbing the ſyſtem in general. I muſt here, however, take notice, that our *Petroleum* is commonly adulterated with two thirds of oil of turpentine, ſo that, properly ſpeaking, the caſes mentioned were only trials of the oil of turpentine. Foſſile oils have been ſaid to be uſeful in Quartans, and, indeed, I conceive this probably to belong to every Antiſpaſmodic. Externally applied, their effects are more conſiderable and more ardent. Anointed on the extremities they are ſaid to defend them from cold, and this virtue has been aſcribed to the Oil of Turpentine and Amber; but on trial they never could be applied without irritation, and diſappointing the effect. They have been recommended in œdematous ſwellings, upon the ſuppoſition that that diſeaſe depended on a laxity of the part; but œdematous ſwellings are often attended with an eriſypelatous in-

ſlammation and tendency to gangrene, which laſt I have ſeen brought on by the application of *Petroleum*. But here we need not be anxious about topical applications, for none of them are of any ſervice except bandages in convaleſcents, as the ſwelling commonly depends on a fault in the ſyſtem. In paralytic caſes they are more effectually employed. Here they ſometimes penetrate deep in the ſyſtem, but I have no faith of their being capable to ſtimulate the *Medulla ſpinalis* when rubbed along the ſpine; nor have I any notion of their ſtopping Intermittents when rubbed upon the breaſt. It has alſo been uſed in rheumatic pains, but whether it acts here from its ſtimulant or antiſpaſmodic virtues is uncertain.

VEGETABLE ANTISPASMODICS.

With regard to the antiſpaſmodic plants, moſt of them might have been inſerted among the Stimulants. Of the firſt ſet, at *a*, *Artemiſia* and *Matricaria* might have been mentioned among the *Syngeneſia*; *Cardiaca* and *Pulegium* among the *Verticillatæ*; *Cuminum*, *Leviſticum*, and *Meum* among the *Umbelliferæ*; and *Sabina* with the *Coniferæ*. All theſe have the virtues of their order. They are repeated here, on account of a rank and fœtid odour they poſſeſs, which, with ſome other qualities joined to them, is the foundation of their antiſpaſmodic virtue. All Antiſpaſmodics are odorous: In ſome, the odour is of the fragrant kind, but more commonly as it grows are directly fœtid.

At *a* is inſerted the title

HERBÆ FOETIDÆ.

All theſe may be uſeful in ſpaſmodic affections. Some of them are recommended in epileptic caſes, but this not ſo univerſally. Much oftner have they been uſed in Spaſms of the alimentary canal, or what is called the Hyſteric diſeaſe. Nay, their action has been ſuppoſed to extend farther, and to take off thoſe ſpaſms in the uterus, which are the cauſe of the obſtruction of the menſes, and other

other ſymptoms attending thereon. Theſe are the general qualities of theſe plants. We ſhall only make remarks on a few of them.

ARISTOLOCHIA.

This might have been marked with the acrid Bitters, formerly mentioned. Its acrimony appears, from its vomiting in a large doſe. It enters into the compoſition of the Gout Powders, and has at all times been famous in this diſeaſe. A medicine has lately come over from Germany, taken by ſome here for the ſame complaint, which is found to be a tincture of the *Ariſtolochia* and *Serpentaria* joined. The tincture of *Ariſtolochia* is openly uſed by others in the ſame intention.

The ſame obſervations are to be made with regard to the *Ariſtolochia* in the Gout, as on the Gout Powder in general. It is this which Boerhaave tells us, and which Haller repeats, that takes off the villous coat of the ſtomach; and this perhaps, in ſome meaſure, may point out its uſe in the Gout. *Artemiſia* is more fœtid than the reſt of the claſs, and hence has been ſuppoſed ſtronger; but I imagine it has no title to any virtues but what are contained in Wormwood.

ATRIPLEX OLIDA.

This gives out a ſaline matter, both volatile and fixed, in greater proportion than any other plant I know. Indeed it ſeems *ſui generis*, and may perhaps have ſome peculiar virtues. Its odour is not very volatile, and the plant can be very well preſerved, both in extract and by drying. I have not ſeen many trials made with it. Several times, however, in form of tea, I have ſeen it of advantage in hyſteric caſes.

RUTA.

This is a plant of ſeveral peculiarities. Although this plant does not contain much eſſential oil, on which I ſaid the virtues of the ſet we are talking of depended, yet it has rather a ſtronger anti-

ſpaſmodic

ſpaſmodic virtue than any of them. As its parts are pretty fixed, the virtues of this plant may be got pretty entire, either in inſpiſſated juice, or as extracted from the plant. Rue particularly has been recommended in Epilepſies and hyſteric complaints, and wherever in ſuch caſes the complaints can be bettered by ſtimulants, Rue may be employed. All the plants we have mentioned may be called anthelmintic, and none more properly than the Rue. By the mouth it will not go ſo far in any quantity in which we exhibit it; but in a glyſter, a ſtrong decoction of it is often employed to deſtroy the *aſcarides* which infeſt the *rectum*.

SABINA

abounds in eſſential oil more than the reſt, and is a powerful ſtimulant, inſomuch that, externally applied, it has been ſaid to deſtroy worms. I have not ſeen this effect. Internally it has the ſame qualities with the former.

Oppoſite to *b* is inſerted the title of

GUMMATA FOETIDA.

The *Tacamahaca*, which ſtands at the end, might be inſerted with the *Storax* and *Labdanum*. The other five are very much of common virtues. They are all taken from umbelliferous plants, which indeed are moſt peculiar to Europe, and therefore as the Gums of theſe exotics come ſo often to us adulterated, we ſhould carefully endeavour to find ſomething of the ſame kind in our own plants. Though I have formerly pointed out the *Umbelliferæ* as poiſonous, and the Gums might be ſuppoſed of the ſame virtues, yet as ſuch qualities are often loſt by drying, I would hence inſinuate, that ſome of the moſt acrid juices of our own plants may prove the moſt excellent medicines. Of *Aſſafœtida*, *Galbanum*, and *Sagapenum*, the virtues ſeem manifeſtly lodged in an eſſential oil, which riſes either with water or ſpirit. The oil of *Opopanax* is more ſparing, and the *Gum Ammoniac* gives no eſſential oil at all in diſtillation.

diſtillation. Hence I would alledge, that of thoſe which have the greateſt proportion of eſſential oil the antiſpaſmodic virtues are greateſt, and ſo in proportion. They all ſtimulate the ſtomach, and in the countries where they are produced are employed to excite appetite and promote digeſtion. With us they are uſed as ſtimulant and antiſpaſmodic, proving carminative in the ſtomach and inteſtines, and uſed to take off the remarkable ſpaſmodic affections happening in the alimentary canal in the hyſteric diſeaſe. Like Aloes they are laxative to a certain degree, and like this, too, by frequent uſe, are apt to irritate the *rectum*, though neither in their irritant or purgative qualities are they ſo powerful as Aloes. Theſe, like the *Fœtidæ* formerly mentioned, have been uſed as anthelmintic; and there are frequent inſtances of ſtrong odour affecting the inſect tribe. *Aſſa fœtida* has been long employed for this purpoſe, and lately has again been brought into practice. In the blood they are frequently diuretic, but are more remarkable ſtill for their diaphoretic virtues. Sanctorius teſtifies, that the *Aſſa fœtida* is the ſtrongeſt in this laſt virtue. From theſe qualities they may be juſtly reckoned pectoral, not only promoting the ſecretion of mucus in the lungs, but perhaps alſo as carrying thither their antiſpaſmodic virtues. The Ammoniac being recommended as the moſt powerful pectoral, would make me doubt of this laſt ſuppoſition; but for my part, I am apt to give the preference to the *Aſſa fœtida*, which, however, is one of the warm pectorals moſt frequently abuſed. Like Caſtor, theſe gums have been employed in Fevers, and where we can judge the proper time of exhibiting ſtimulant Antiſpaſmodics, they might be uſeful; but as I find their ſtimulant exceed their antiſpaſmodic virtue, I employ them very little. Their emmenagogue property I conſider as an effect on the whole ſyſtem, and ſhall afterwards mention it. I imagine it is not without ſome foundation, that they have been ſaid to occaſion a rarefaction and turgeſcence of the whole maſs of blood. With regard to Aloes, this is in a manner proved, it not only inducing the hæmorrhoidal flux, but alſo promoting other hæmorrhages, and poſſibly, by this means, the menſtrual evacuation. In general, as antiſpaſ-

tiſpaſmodic, the more ſubtile the odour the better, and therefore I imagine it is not without reaſon, that *Aſſafœtida*, in our preſent practice, ſeems to have ſupplanted the reſt.

As to all, for the purpoſe of medicine, they are of eaſy preparation, and may be extracted either by water or ſpirit, more effectually by the laſt. The doſe is difficult to aſſign, not only on the account of their different effects on different perſons, but alſo from their ſtrength varying according to the time kept. I exhibit them from five grains to ʒj. I have known ʒij. of *Aſſafœtida* taken in twenty-four hours with little effect, but this muſt not be taken as a general rule, and probably depended on the impurity of the medicine.

CAMPHIRE.

This is a ſubſtance, which, for the good or harm it can do in medicine, deſerves particular attention. It is a ſubſtance of a very peculiar kind in nature, like to which we can produce nothing by art. It approaches in its nature to the eſſential oils, is got from vegetables by diſtillation with water, is of an acrid odour, and ſoluble in Alcohol; but, like theſe, it does not ſuffer a decompoſition with diſtillation, nor ſeparate as they do into oil, acid, and earth, but riſes always in the ſame manner as before. It differs alſo in its relation to acids, uniting with them without efferveſcence, and ſeparable from them by affuſion of water, without any change. We may allow, laſtly, its mode of concretion to be peculiar. It is alledged, indeed, that ſomething of the ſame kind is to be ſeen in eſſential oils. I have always perceived this concretion in eſſential oils to be different, and more approaching to regular chryſtallization. What is to be made of theſe peculiarities, I cannot determine. As to its botanical analogy, it is got from a ſpecies of the *Laurus*. Our common *Laurus*, in its ſenſible qualities, is nearly related to the *Lauro-ceraſus*, which I mentioned as a ſtrong Sedative; and, indeed, all the ſubſtances which have the laurel bitter, are juſtly ſuſpected of the ſame nature. Camphire, though more poignant, appears

pears to me to have the ſame taſte and odour, and therefore, in the firſt place, I would inſinuate a ſuſpicion of the ſame qualities, and conſequently a caution in the exhibition. Mangini, of Bologna, has been employed in making experiments with Camphire upon different animals, and has found it poiſonous to every one of them. Birds were killed with a few grains, and large doſes either drove into a rage, or deſtroyed, quadrupeds. I have only theſe accounts from a Literary Journal. From it, however, it appears, that in ſome animals it produced ſleep, followed by death, without any other ſymptom; that in others, before death, they were awakened into convulſions and rage. It ſeems, too, to act chiefly on the ſtomach, for an entire piece ſwallowed, produced the effects mentioned, with very little diminution of weight, as appeared from its being afterward thrown up. I mention all this, to ſhew the power of Camphire on the ſyſtem, and at the ſame time to point out its danger.

The virtues of Camphire have been much diſputed. You will eaſily ſee how that happens, from the different effects of different doſes on different conſtitutions. Its conſiderable acrimony, ſtrong odour, and that of the diſagreeable kind, would lead us to think Camphire a ſtimulant. Theſe ſenſible qualities have given occaſion to a diſpute not yet properly determined, whether this medicine be heating or cooling. In the fauces it produces heat, and in ſome, when taken into the ſtomach, it is rejected with an uneaſy ſenſation, at the ſame time producing heat, while in others it may be taken in large doſes, without any ſenſible effect at all. Diſputes alſo have ariſen about the reaſon of the diverſity of the effects of Camphire. Some account for it from the Camphire being taken in entire pieces, and alledge, that in our powders there are always ſome entire molecules, which, from their leſs ſpecific gravity, are buoyed up, and ſtimulate the ſenſible upper orifice of the ſtomach, and produce the heat mentioned. This certainly ought to give us a caution, in order to the minute diviſion of Camphire, when exhibited. But to proceed in its heating and cooling effects. I think it is now pretty generally agreed, that it is rather cooling, not ſtimulating the heart

and veſſels, nor producing exacerbation of Fever. In ſhort, the antiſpaſmodic virtues of Camphire are the only ones agreed upon, and it is for this, and ſuch like diſputed ſubſtances, that we muſt make a diſtinct head of Antiſpaſmodics.

As antiſpaſmodic, it has frequently been employed in the hyſteric diſeaſe, and complaints of the hypochondriac kind, and wherever theſe are purely ſpaſmodic, in a proper doſe, it may be of ſervice. Camphire has alſo been employed in *Mania*. Dr. Kinnear, in the Philoſophical Tranſactions, gives us ſeveral inſtances of *Manias* cured by it, when given in the doſe of ʒſs. I am ready to believe the Doctor's ſucceſs; but there are ſeveral different kinds of *Mania*, and, after ſeveral experiments, I cannot ſay the Camphire ſucceeded. Sometimes, indeed, it produced a quieter night and day, but never effected a cure; but in a diſeaſe ſo obſtinate, and ſo adapted to violent remedies, the Camphire ought not too haſtily to be rejected. Like other Antiſpaſmodics, Camphire has not been much recommended, perhaps from the uncertainty of its effects, and the great variety of cauſes from which that diſeaſe may proceed; and indeed I have ſeen it fail in Epilepſy. But in other caſes I have ſeen its good effects, and where the fits were frequent, it often produced large intervals; and where the diſeaſe was in ſome meaſure accidental, ariſing from paſſions of the mind, as fear, *&c.* I have ſeen it work a perfect cure.

The chief uſe of Camphire has been in Fever. Whether there it acts as an Antiſpaſmodic, I ſhall leave you to decide. Some extend it univerſally to all Fevers, while others confine its uſe to thoſe of the malignant kind, recommend it even in the Plague itſelf, in putrid Fevers, and all thoſe attended with Exanthemata, as the miliary, and petechial Fevers. In this country we have no proper malignant Fever, ſo that I cannot ſpeak as to its uſe in theſe. We uſe it in the nervous Fever, where the *vis vitæ* is ſunk, and there find it of great ſervice, and I begin to think we ſhould find it of ſtill greater, were we to employ it in larger doſes. Heucher, in his

Diſſer-

Diſſertation, entitled, *Ignis igne extinguendus*, who appears to have much experience upon this ſubject, recommends Camphire in Fevers of all kinds, eſpecially the laſt we have mentioned. Pouteau, who attends an hoſpital of lying-in women, in a book lately publiſhed, entitled, *Melange de Chirurgie*, tells us, that an epidemic ſeized upon the women, attacking them with Colic and a Fever, whoſe ſymptoms ſhewed it of an inflammatory nature, and where, on diſſection, the bowels were found inflamed, which inflammation extended to the uterus, whoſe inner membrane appeared livid and gangrenous. Here Mr. Pouteau exhibited Camphire, diſſolved in oil, and made into a ſyrup, in the quantity of five grains, of which three doſes were repeated in half an hour, and one five hours after, and ſo on till about thirty grains a day, by which means he operated a perfect cure. As to the manner of action: In one woman, after delivery, who was ſeized with a violent pain and colic, and in whom the diſeaſe was urgent, the Camphire was given to the quantity of ſixty grains in half an hour, by which ſhe was entirely relieved; but upon being put to bed, was ſeized with a paleneſs and chillneſs, which ſeemed to threaten inſtant expiration, which ſymptoms were relieved by warm wine, and the application of warm cloths. The coldneſs was without any *friſſon*, or ſhivering, and ended with a ſweat, and the woman was quite well afterwards. An inſtance analagous to this has occurred to myſelf, of a maniac, who got forty grains of Camphire at once, and fell down cold and pale, with a weak and ſmall pulſe, but ſoon after recovered. Another inſtance of the effect of Camphire you may ſee in Dr. Hoffman, in the firſt volume of his Conſultations, in a caſe entitled, *De Camphoræ in Doſi ℈ij. effectu.* I have mentioned all theſe inſtances, to ſhew the effects of Camphire as a Sedative, in weakening the motions of the ſyſtem, in weakening the action of the heart and veſſels. But to go on with the uſe of Camphire in Fevers. Pouteau alledges, that Camphire is of no uſe in a Phlegmon, but in the Eriſypelas is a perfect cure. He tells us it is of uſe in vernal Pleuriſies and Peripneumonies, which, he ſays, are of the eriſypelatous kind, and that it was from ſeeing in the caſe of the

women, the erisypelatous nature of the inflammation upon dissection, that led him then to the use of Camphire. This sort of reasoning is very doubtful. The Erisypelas and Phlegmon are very difficult to distinguish, and in our practice here we use Camphire promiscuously in all external inflammations, and seemingly with equal success, sometimes answering and sometimes failing. There is one case, *viz.* in rheumatic affections, which approaches nearer to the phlegmonic nature, where we find the Camphire of particular use. If externally the distinction between Erisypelas and Phlegmon is so difficult, it must be more so internally. There are very few authors who take notice of internal Erisypelas. You may see an instance of it in Lommius; but such are very rare. It was therefore incumbent on Mr. Pouteau to distinguish them; for Vernal Pleurisies and Peripneumonies are here, and, as far as I have been able to learn, over the torrid zone, of a general inflammatory nature. Nay, we may go farther, and say, that even Pouteau's dissections seem to show the inflammation of a phlegmonic nature. If we can make any proper distinction between Phlegmon and Erisypelas, it is this, that the Phlegmon is in the proper cellular membrane below the skin, while Erisypelas is situated in the rete mucosum. Hence, then, we are rather to take Mr. Pouteau's facts as instances of the powers of Camphire in inflammatory cases in general. Although we cannot admit of the distinction here, yet there is another curious enough instance given by the same Gentleman. He tells us, that a Gangrene is surrounded with an erisypelatous circle, which seems to be the cause of its spreading, and that, on the exhibition of Camphire, the progress of the mortification is stopped, and the Erisypelas changed into a Phlegmon. So much for the use of Camphire in Fever. Hoffman, in his treatise, *De tuto Camphoræ usu interno*, gives us a great many instances of Nervous Fevers cured by Camphire, and also some of the purely inflammatory kind. Here we do not employ it in the last mentioned cases. When the effects of Camphire are not evident, I imagine it is from not throwing it in in sufficient large doses.

As

As a-kin to its effects in inflammatory caſes, we ſhall next mention the uſe of Camphire in Hæmorrhages. Hoffman, and the German Phyſicians recommend it ſtrongly in Hæmorrhages of all kinds, and when given in the doſe of ʒß. it does not encreaſe the frequency of the pulſe, and ſo poſſibly may be of advantage; but I have had no experience of it. This quality does not agree with another aſcribed to Camphire, *viz.* promoting the menſtrual flux, which from its antiſpaſmodic power it may. Neither is this eaſily reconciled with another effect attributed to Camphire, *viz.* giving fluidity to the blood. I could wiſh the experiments upon which ſuch concluſions have been formed had been more accurately examined.

Hoffman mentions the uſe of Camphire in the *Lues Venerea*, in all its ſtages, and even in a recent Gonorrhœa recommends it as a moſt effectual remedy. Hoffman, in this caſe, appears not to have ſpoken from his own practice, and, indeed, he talks very looſely upon the ſubject, and not condeſcending on the manner of exhibition. Poſſibly in the recent Gonorrhœa it might be rubbed externally on the penis, in the manner of unction, in order to allay the inflammation, which is the firſt thing indicated in that diſeaſe, and in the more advanced ſtate of the diſeaſe might be joined with other diaphoretics. Poſſibly ſome might think here of its acting in another way. Camphire has been ſaid to weaken the genital powers. It is not eaſy, from experience, to determine this. Some experiments mentioned in authors ſeem directly to contradict it; and from theſe Camphire ſeems rather to promote venery. However, if it has the power of allaying Inflammation, ſtopping Hæmorrhage, and acting as a powerful Sedative to the ſyſtem in general, I muſt ſay I would expect that it ſhould alſo weaken the genital parts.

This leads to another diſeaſe, *viz.* where an inordinate venereal ſtimulus produces nocturnal pollutions or emiſſions without erection. The cure here is extremely difficult, for the diſeaſe appears attended

tended with a weakneſs of the whole nervous ſyſtem, and thoſe affected in the manner mentioned, are ſome of the moſt remarkable Hypochondriacs I have ſeen. In firſt treating this diſeaſe, I thought of interrupting the habit, and gave Opium in this intention. Sometimes for once it would ſtop the recurrence, but on frequent exhibition I found it rather to encreaſe the diſeaſe from its ſtimulating and accumulating properties. I therefore had recourſe to Camphire, which I found have the deſired effect. It was exhibited at bed-time, as anodyne, and the patient at other times took Chalybeates. Theſe are the particular diſeaſes, in which Camphire has been employed. We ſhall now talk of ſome general qualities attributed to it.

Camphire has been ſpoken of for its ſoporific virtue. In any quantity in which we give Camphire in the human body, I have never ſeen this effect. It is never evident, except when there is an irritation, which Camphire, by taking off, allows the natural tendency to take place. Another general quality attributed to Camphire is that of diaphoretic. Here, in ſo far as diaphoreſis may be promoted by relaxing the ſurface of the body, and taking off ſtricture, Camphire may be of uſe; but in ſo far as a ſtimulus is wanting, Camphire is of none at all; and I have ſeen ℈ij. of it given without any effect, and probably when diaphoretic in Fever, it acts by taking off the inflammation, the ſtimulus ſtill ſubſiſting.

Camphire has been ſaid to be antiſeptic, and to this quality Pringle attributes its effect in malignant Fevers. From what we have ſaid formerly, and Mangini's experiments, it is probable that Camphire acts on the ſtomach; though if any ſubſtance in ſmall quantity can be antiſeptic to our fluids, Camphire has a very good chance to be ſo, as ſo eaſily diffuſible and penetrating over the whole ſyſtem.

EMPY-

EMPYREUMATIC OILS.

The Empyreumatic Oils of Vegetables have probably the ſame virtues as thoſe of Animals, though at preſent out of uſe. The changes wrought both on theſe Oils, and thoſe of Animals, by repeated diſtillations, will be ſeen in the Chemiſtry, which ſee. Lewis commends the Edinburgh Diſpenſatory for rejecting the *Ol. Lateritiæ*; but this is only to be underſtood of its preſent form; for by the changes wrought on it by repeated diſtillation, we have all the reaſon in the world to ſuppoſe its general action on the nervous ſyſtem and antiſpaſmodic qualities to approach to thoſe of the Empyreumatic Oils of Animals. * The Chemiſt, who has brought theſe into reputation, repeated the diſtillation forty times; and in the German Diſpenſatories, the proceſs is directed to be performed fifteen or twenty times. It were greatly to be wiſhed, that ſome means were found to ſhorten a proceſs, which, for its expence and tedioufneſs, our Chemiſts and Apothecaries would be ſo unwilling to undergo†. From its *fœtor* in the firſt diſtillation, we might ſuppoſe the Empyreumatic Oil of Animals antiſpaſmodic, but then this *fœtor* is joined with ſo ſtrong an acrimony, that the ſtimulant overpowers the antiſpaſmodic virtue. Thus Hoffman tells

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* Dippelius.

† The addition of water, and diſtilling from thence, is the method propoſed for expeding this proceſs by moſt authors. Beaumé propoſes the applications of Æther. He alledges, that by the mixture of this, a thick gummy matter is precipitated from the Empyreumatic Oil, and that the liquor above remains more pure. He ſays alſo, that by this management more may be done by two diſtillations, than by ten without it.

Theſe Empyreumatic Oils, whether procured from animals or vegetables, are of the ſame nature, and when brought to the utmoſt degree of purity, are very valuable medicines. In that ſtate they become clear and limpid, ſuffer a great diminution of their ſpecific gravity, are remarkably more volatile, and have their odour and taſte much improved. They likewiſe become ſoluble in vinous ſpirits. By long or frequent expoſure to the atmoſphere they loſe theſe qualities and return to their empyreumatic ſtate. Hence they ſhould be kept in ſmall phials, cloſe ſtopped, and never ſuffered to remain open any length of time.

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us, that a few drops of the *Oleum C. C.* will throw a ſtrong man into a profuſe ſweat, but by repeated diſtillations this *fœtor* is taken off, and the Oils are improved greatly in volatility, their antiſpaſmodic virtues, at every repeated diſtillation, are encreaſed, and they approach to the nature of Camphire. Were it not for their dearneſs, they might certainly externally be employed as antiſpaſmodic. In this way they have been employed for curing Cataracts. In one caſe they checked the progreſs of the diſeaſe, and alleviated the ſymptoms; in another, which was not of long ſtanding, the Cataract was entirely diſcuſſed. Internally, the Empyreumatic Oils of Animals have been uſed in hyſteric and hypochondriac affections; but what they have been chiefly famous in, is the Epilepſy, and I think unluckily; for this diſeaſe often may depend on cauſes out of the reach of Antiſpaſmodics, and, when it is, there are few which can make ſuch a change in the ſyſtem as to take off the irritability; and I imagine that Antiſpaſmodics often fail, both in hyſteric and hypochondriac caſes, becauſe we employ them at all times, whereby they become habitual and familiar to the ſyſtem, and loſe their effect when given in the time of the paroxyſm, where alone we ought to employ them. To take off the irritability we muſt rely on Sedatives and Aſtringents. The Empyreumatic Oils have likewiſe been famous in Intermittent Fevers, when given like Opium before the paroxyſm. They have alſo been uſed in Continued Fever, and with ſome, with all the reputation of Camphire; though this uſe of them has been founded on few experiments. They have been ſtill more famous than Camphire for their anodyne properties, but, like it, I imagine they act rather by taking off ſpaſm and irritation, than by any properties directly anodyne.

ÆTHER.

Æther is very analogous to the ſubſtances of which we have been juſt treating. It is an oily matter, colourleſs when pure, and ſoluble in alcohol, reſembling, as I would alledge, in taſte and flavour, the ſubſtances of which we have been talking, and though

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of different production, yet of ſimilar virtues. Its effects as anti-ſpaſmodic are now ſufficiently known. It has been found uſeful in Head-achs of the ſpaſmodic kind; nay, even in inflammatory and rheumatic Head-achs. There is one caſe, *viz.* the Tooth-ach, in which, if properly applied, it not only gives a momentary, but durable relief. In order to its action, it muſt be converted into vapour, which is done by the heat of the body, and therefore, in applying it, we cover the part with the palm of the hand, in order to drive back the vapour, and prevent its diſſipation in the air. It would be worth while to imitate the ſame practice with Camphire. The Æther is more volatile, has ſome advantages over the Camphire, and becomes more quickly applied to the particular nerves affected. Hence Æther is properly preferred to it in all ſpaſmodic affections of the ſtomach and *primæ viæ*. The method of exhibiting it, is by diffuſion in water, by which means, if not diſſipated, it will probably act more powerfully. How far its uſe might be extended to other ſpaſmodic caſes, I do not know. Perhaps it might be employed in Epilepſy. In Fevers it is not employed; but if you conſult Dr. Hoffman, you will find it often employed here; and in ſo far as his teſtimony is to be taken for a medicine of his own invention, (for the *Liquor anodynus mineralis* is nothing elſe but Æther diffuſed in Spirit of Wine,) and by which he was to obtain profit, it is found of conſiderable virtues.

ESSENTIAL OILS.

Theſe are ſeparated and depoſited in particular cells, exiſting more copiouſly ſometimes in one, and ſometimes in another part of the vegetable. Theſe we can ſometimes obtain exactly as Nature prepares them, by opening the cellular texture of plants, and treating them by expreſſion. But this is ſeldom practicable, and we are obliged to have recourſe to the aid of diſtillation. But from the heat applied we ſhould always be on our guard againſt any changes they undergo in diſtillation, either from exceſs of heat giving them an empyreumatic taint, or raiſing along with them a portion of groſſer

matter. Procured with all the art poſſible, Eſſential Oils are liable to ſuffer conſiderable changes on being kept, and to loſe their *ſpiritus rector* and medical portion, unleſs accurately ſecured from the air. The *ſpiritus rector* has, indeed, gone off, but in inconſiderable quantity, but the remainder is ſo entangled in the now thickened Oil, as not to exert its medical virtues. All this ſhows us, that if we depend on any virtues in the Eſſential Oils, we muſt uſe them as recent as poſſible.

The virtues of Eſſential Oils are generally thoſe of the Plants, from which they are derived. Formerly it was ſuppoſed they contained all the virtues of their reſpective ſubjects, and hence were called Eſſences; but this we now find is the caſe with very few: The virtues of Plants are not always confined to theſe odorous parts. We are not to expect the Aſtringency of Cinnamon in its Eſſential Oil, or the Bitterneſs of Wormwood. Hence it might be ſuppoſed, we could talk in general of the virtues of Eſſential Oils as diſtinct; but there are not yet a ſufficient number of experiments to enable us to attempt this, or to determine their differences.

Eſſential Oils are chiefly taken from the claſs of Stimulants. The *Verticillatæ* all give out an Eſſential Oil, the virtues of which are more in common than that of the Plants themſelves; for theſe often have their diſtinguiſhing property depending on a more fixed part. With regard to the *Umbellatæ*, the ſame ſeems to take place; but ſufficient experiments have not been made to determine, whether the Eſſential Oils of this claſs partake of its poiſonous qualities. The *Siliquoſæ* are not commonly ſuppoſed to contain an Eſſential Oil, but accurate experiments now ſhow that they do, and that an Eſſential Oil, of a valuable kind probably, as very volatile, pungent, and diffuſible, and the more volatile and penetrating the parts, the more antiſpaſmodic virtues we find. The *ſpiritus rector* is very copious in Muſtard and Horſe-radiſh, and ſo alſo is, probably, in their Eſſential Oil. The ſame obſerva-

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tions poſſibly apply to the Oils of the *Alliaciæ*. A particular kind of Eſſential Oils is got from the *Coniferæ*, affording us the ſeveral balſamic ſubſtances. The Oils of the aromatic claſs approach to the nature of Camphire. The Oils of other ſubſtances have different virtues, which will be underſtood from what we have ſaid of the virtues of their reſpective plants reſiding in a volatile or fixed part.

All the Eſſential Oils have been introduced as antiſpaſmodic, but fall ſhort of Camphire, Empyreumatic Oils, or Æther. Their action is more confined to the part to which they are applied, and hence they are more remarkable as Carminatives, than in their effects on the ſyſtem. They, too, have more of a ſtimulus than any of the ſubſtances we have been mentioning, and therefore they ſhould be given to the torpid and flaccid, and not to the inflammatory.

From their not containing all the virtues of the ſubjects from whence they are drawn, and from their frequent adulteration, a great many of the Eſſential Oils have been rejected from practice, and even thoſe which are ſtill in our diſpenſatories, rarely occur in preſcription. We are, however, apt to run into exceſs, both in our favours and prejudices, and poſſibly there may be exceptions to our general rules. What we have ſaid of Eſſential Oils applies ſtill more to diſtilled waters; for the impregnation in them is inconſiderable, inſomuch, that little virtues are now expected from them. Even here, however, there are exceptions, and we ſee Pepper-mint water is a very valuable medicine, both as carminative and antiſpaſmodic in the *primæ viæ*, and this virtue probably is more active in the water than in the Eſſential Oils. This is ſomewhat contradictory to what we were juſt now ſaying; but certain it is, that ſeveral plants have their Eſſential Oils and diſtilled Waters more active than in the plant in ſubſtance. A glaring inſtance we have of this in the *Lauro-ceraſus*, which Langriſh found of ſuch pernicious properties in diſtilled Waters, and of a much milder nature when exhibited in ſubſtance.

MUSK.

As approaching to the former ſubſtances in virtues, I chuſe to treat of Muſk here. Muſk is among the few medicines afforded us by the animal kingdom. It is an animal ſubſtance of a peculiar kind, containing a conſiderable portion of Eſſential Oil, and on that account belonging to the antiſpaſmodic claſs. It is extremely volatile, quickly diffuſed, the moſt odoriferous ſubſtance in nature, and at the ſame time the moſt retentive of its odour. Muſk has long ſtood in the liſt of officinal medicines, but its virtues, I imagine, have not been known till of late; for which we are entirely obliged to the Chineſe. As by them taught to exhibit it in a large doſe, we have found it a valuable antiſpaſmodic, and indeed have uſed it in all kinds of ſpaſmodic affections. We have employed it in hyſteric and hypochondiac affections, which we are very apt to think always to take place, when there are ſpaſmodic affections of the alimentary canal; whereas they often proceed from Gout; but even here Muſk has been found of advantage, and it has been known to cure a Gout in the ſtomach, as may be ſeen in the London Eſſays. In ſhort, it is limited to no ſpaſmodic affection. It has been found of advantage in the Hiccup, and from Hillary we learn, in thoſe violent ſpaſmodic affections called the *Colica pictonum*. The analogy has not been extended to the *Ileus*, though I think it may. Muſk is often uſeful in Epilepſy, but with the ſame reſtriction as we have given already upon the uſe of Empyreumatic Oils there. In the *Tetanas*, we learn from Hillary, that Muſk, conjoined with Opium, is an effectual remedy. The Muſk, as we now employ it, was chiefly introduced for its effects in the *Rabies canina*, by the Chineſe, and its efficacy here is now ſufficiently known; and, indeed, we have reaſon to imagine it will be ſucceſsfully employed there, as it is pretty generally thought, that this diſeaſe is only to be conſidered as a ſpaſmodic affection; and wherever we are doubtful of the nature of the diſeaſe, we may reaſonably deduce it from the nature of the remedy employed.

In Fever, too, Muſk has been exhibited. Whether this is always to be conſidered as a ſpaſmodic affection, I ſhall not determine; but wherever theſe occur, accompanied with tremors, *ſubſultus tendinum, &c.* Muſk not only is effectual in relieving theſe, but in taking off the Fever itſelf. From Dr. Wall's practice we find it has been of uſe, where an inflammatory diatheſis is preſent; but whether properly it ought to be employed in ſuch caſe, I ſhall not determine. In all the nervous and malignant Fevers, Muſk is of ſignal advantage; and Mr. Reid has found it of great efficacy in the jail diſtemper. I wonder Dr. Pringle ſays nothing of its uſe in theſe diſeaſes. From this, however, I would conclude, he has no material objection to it. He gives, indeed, an inſtance, where its effects, he ſays, were not ſo ſudden as in Mr. Reid's caſes, but this was far from making a fair trial.

There is one other diſeaſe in which Muſk has been employed, *viz.* in *Mania*. This diſeaſe often depends upon cauſes not to be removed by any medicine, and is often hereditary. In ſuch circumſtances, Muſk, like other remedies, fails: But I have ſeen Muſk have more effect than any other remedy. I have ſeen a cure obtained by it; and in other caſes it would probably have the ſame effect, had the doſe been largely continued.

ZIBETHUM, CIVET.

Civet is an odorous, oily, animal ſubſtance, which we may therefore ſuppoſe of ſimilar virtues to Muſk; but I know nothing in practice that either confirms or confutes this analogy.

CASTOR.

This is more frequently employed. It has its virtues depending on an Eſſential Oil. Beſides this and the two former, I know few animal ſubſtances of the ſame kind. In the Caſtor the odour is not ſo volatile, and is of the fetid kind, which has been ſuppoſed the foundation of its antiſpaſmodic virtue; but from the analogy of Muſk we

we ſee, that agreeable odours may be antiſpaſmodic as well as fetid. Caſtor has been employed as an antihyſteric, and in feveriſh caſes. Like the Eſſential Oils it has a ſtimulant joined with an antiſpaſmodic quality, and is often more hurtful by the former than advantageous by the latter. Its antiſpaſmodic qualities otherwiſe are by no means remarkable, whence it is, that Caſtor of late has been much neglected in practice.

In our Diſpenſatory ſtand both a ſimple and compound tincture of Caſtor, the former intended for thoſe with whom *Aſſa fætida* diſagrees. There have been diſputes about the menſtruum, but it is now agreed that pure Alcohol is beſt, and that any other menſtruum extracts more of the diſagreeable, and leſs of the uſeful parts. Our College, in the compound tincture, have attempted a refinement, and ordered the extraction to be made by the *Spiritus volatilis oleoſus*, but this limits the doſe of the Caſtor, and weakens the ſpirit, which gives us a weaker impregnation.

The next thing we conſider is the proportion; and in ordering a greater quantity of Caſtor, the Edinburgh College is the more judicious. Nay, Alcohol will diſſolve more Caſtor than is commonly imagined. The firſt extraction is of the moſt ſubtile kind, the others leſs uſeful, and more diſagreeable. Hence I think we might employ cohobation; employ, *e. g.* ℔j. of Alcohol, to extract ʒj. of Caſtor, and then apply the ſame Alcohol to freſh parcels of the drug.

CASSUMUNIAR, PÆONIA, VALERIANA SYLVESTRIS.

We have, in the account of the ſubſtance in the Catalogue, been obliged to tranſpoſe a little, in order to bring our moſt powerful Antiſpaſmodics together.

Caſſumuniar ſhould not have ſtood in this part of our liſt, but along with the *Zedoary* and *Serpentaria*. With the Zedoary it agrees both in botanical analogy and ſenſible qualities, and hence its virtues

virtues may be deduced. It is now, however, disregarded, though formerly in high reputation, on account of that favour we so lavishly bestow upon exotic medicines.

Pæony has long stood in our lists, but I can find no writer or practitioner who can give testimony of its virtues from particular experience. Besides, there is a suspicion of its poisonous qualities, and botanical analogy inserts it into an acrid class.

Valeriana Sylvestris is the only one of the three which is at present in repute as an Antispasmodic. It was introduced on the authority of Fabius Columna, one of the restorers of botanical knowledge, and a man of industry and discernment. He tells us, he cured himself of an Epilepsy by it. It was afterwards disregarded, but is now used in every species of spasmodic affection. Its odour seems to point out this quality; but for my part, after having seen it employed in a number of cases, it has failed altogether, or produced very inconsiderable effects. Physicians acknowledge this, but say it is owing to the smallness of the dose. Linnæus, who seems to have had a good opinion of Valerian, marks, as the medium dose, ʒij. of the root in powder. I have given to the quantity of ʒss. without any effect. However, I am apt to think this might be owing to the badness of the medicine. Valerian is only perfect when it is taken up in the spring, before its leaves are shot out; whereas we commonly get it as taken up at the end of summer, when it is flowering. When in proper condition, it is alledged to be gently purgative and diuretic. It contains a considerable portion of saline matter, which supports its diuretic virtue.

The dose in which Valerian must be exhibited in substance, shews that little advantage can be got in extracting it by any menstruum, as we can hardly get one in which it could be taken in sufficient quantity. Hence the impropriety of Alcohol, Brandy, or even Wine. Water is the only menstruum by which we can extract it, and at the same time could exhibit it, thus extracted, in sufficient quantity.

quantity. The London College infuſe it in *Spt. volatilis aromaticus*, but it is plain that this muſt give but a weak impregnation, that the impregnation got can only be exhibited in very ſmall doſes, and that the whole of its virtues muſt depend upon the menſtruum. It is the chief ingredient in our *Tinctura Cephalica*.

VOLATILE ALKALI.

I have ſaid that the antiſpaſmodic virtue reſided in Eſſential Oil. There ſeems an exception with regard to the volatile alkaline ſalts, but if we conſider their origin, and inflammability with nitre, this exception will not appear ſo ſtriking as would be at firſt imagined. As Muſk is the moſt odoriferous of natural ſubſtances, ſo Volatile Alkali is the moſt odoriferous of the artificial. Upon this footing it has been frequently experienced a powerful Antiſpaſmodic. It is conſiderably acrid when applied to the tongue, and that in inconſiderable quantity; but if by any means we could defend from its action the mouth and fauces, it might be thrown into the ſtomach in a large doſe, even without inconvenience. From its volatility and ſubtilty it proves the quickeſt Antiſpaſmodic in the ſtomach in nervous affections. I have ſaid theſe ſpaſmodic affections often depend upon Gout.

Hence it is employed in all caſes of Fever, where Stimulants and Antiſpaſmodics are neceſſary. In conſequence of thoſe virtues, it is a powerful Diaphoretic. On this account it has been ſaid to be alexipharmic, or expelling poiſon and contagion of all kinds. Now we know that in the caſe of poiſon, as well as many others, we ought not ſo much to regard the cauſe as the effects, *viz.* the ſpaſmodic affections, *&c.* commonly produced. It is on this account Juſſieu, in France, has found the Volatile Alkali, after repeated trials, ſo uſeful in obviating the effects of the bite of the viper. Thus from the nature of the remedy, we may fairly make a judgment of the nature of the diſeaſe. But with regard to its effects in determining to the ſurface. The danger of Fevers depends moſtly on the

the cold fit, and it is in the cold fit of Intermittents that moſt people die. To relieve this, we have not many medicines, but the Volatile Alkali is employed with advantage. This cold fit appears in various forms, and I have ſeen it often appear in a ſtretching of the cheſt, and cough. The Volatile Alkali given here, brings on an agreeable heat, and determines powerfully to the ſurface. It is alſo recommended as pectoral on the ſame footing. We cannot omit ſaying ſomewhat here as to the antiſeptic quality attributed to it by Pringle. It is as poſſeſſing this virtue, that he employs it in malignant and putrid Fever; but it is evident, from the ſmall quantity in which it acts, and the ſuddenneſs of the operation, that, as antiſeptic to our fluids, it is of no efficacy, and that it acts almoſt entirely in the ſtomach.

Formerly it was ſuppoſed that the Volatile Alkali differed according to the ſubſtances from which it was procured; but now we know, that, if equally pure, it is always one and the ſame. Got from Sal Ammoniac, it is pure; as procured from animal ſubſtances, it is contaminated with empyreumatic oil, and perhaps that oil contributes to its virtues; but ſurely the difference cannot be great; and if we want to join ſuch an Antiſpaſmodic along with it, we ſhould chuſe one whoſe doſe and effects we can better aſcertain, *e. g.* the *Oleum animale.* But there is another more conſiderable difference, *viz.* as it is employed in its cauſtic, or mild ſtate. Certainly, as an application to the noſtrils, the former is preferable, and the French practice with *Eau de Luce,* confirmed, indeed, by our own experience, ſhews the uſefulneſs of that impregnation. It acts without inconvenience, and more ſuddenly, which is a great matter; and indeed I make no doubt, but that in almoſt all caſes it would be preferable, could we defend from its acrimony the mouth and fauces.

FULIGO, SOOT.

I have ſet down this among the Vegetables, although I believe there is little difference between the vegetable and foſſile Soots. An

arſenical matter, however, may accompany frequently the foſſile Soot, volatilized with the pyrites contained in foſſile inflammables, and therefore a proper caution is neceſſary when we uſe it as a medicine. Soot is a very heterogeneous ſubſtance, containing, beſides Sal Ammoniac, a quantity of naked Volatile Alkali, enveloped more or leſs in an empyreumatic oil. The Volatile Alkali is very apt to fly off, and hence we ſhould uſe the Soot as freſh as poſſible. Even as the Volatile Alkali and Oil ſtand in Soot, they are certainly antiſpaſmodic; and I have known obſtinate head-achs cured by the uſe of Soot, in the doſe of ʒſs. continued for ſome days; but then in other caſes it failed in the ſame diſeaſe.

As Fuligo even fails in ſubſtance, much more will it do ſo in the weak impregnation obtained by tincture. The *Aſſa fætida* joined to it may be of ſome advantage, but that can be very little. The London College gives us a tincture of *Aſſa fætida* with Soot, which may be uſeful, as the menſtruum employed extracts the Eſſential Oil, on which its virtues depend; but even there the doſe is limited by the menſtruum.

We have now finiſhed particular Antiſpaſmodics, and have, according to our cuſtom, ſubjoined ſome general titles: *Aſtringents, Emollients, Demulcents, Stimulants, Sedatives.*

Aſtringents are antiſpaſmodic, by taking off the laxity on which mobility depends. All our Antiſpaſmodics are only effectual in the time of the fit. It is Aſtringents which we muſt uſe to obviate the return of Spaſm, and when Spaſm occurs, Antiſpaſmodics. To obviate Spaſm we uſe Iron, Lead, Copper, and Peruvian Bark. Spaſm may ſometimes be owing to an over diſtenſion, as well as laxity, and hence *Emollients*, by relaxing the ſimple ſolids, may take off the continuance of the Spaſm. A very frequent cauſe of Spaſm is Acrimony. *Demulcents*, by obtunding this, will take off the Spaſm, by leſſening or removing the cauſe. It is a doubt whether all our

Antiſpaſ-

Antiſpaſmodics are not ſtimulant or ſedative. Very frequently at leaſt we can refer them to one of theſe heads.

We have now finiſhed the conſideration of Medicines which act on the Solids. Theſe, as moſt important, we have conſidered firſt; for the Medicines which act upon the Fluids, do ſo commonly in conſequence of acting on the Solids. I do not ſay this is the conſtant, but certainly it is the general caſe, and every day we ſee Writers, as well as Practitioners, inclining to the pathology of the ſolids.

The medicines, which act on the fluids, are divided into thoſe, 1. Which act on the circulating fluids; 2. Into the evacuants, or thoſe which act on the excretions. The *Alterantia*, or thoſe medicines which act on the fluids ſtill remaining in the ſyſtem, may be divided into two kinds; 1ſt, into ſuch as affect their conſiſtence or coheſion; 2dly, into ſuch as affect the mixture of our fluids. To the firſt head belong the *Attenuantia* and *Inſpiſſantia*; to the ſecond head the *Demulcentia*, *Antacida*, *Antalkalina*, and *Antiſeptica*. Before we enter into the conſideration of theſe, we ſhall endeavour to ſay ſomething on the nature of Animal Fluids in general, whether with regard to their chemical conſideration, or with regard to *Materia Medica*.

On the NATURE of ANIMAL FLUIDS.

This I conſider as the moſt difficult part of the taſk in which I have been engaged. Moſt of what has been ſaid or wrote upon this ſubject is very imperfect. There was no book in which I expected more than the ſecond volume of Haller's Phyſiology; but as a compilation, I find it only collected from thoſe, whoſe views are not opened on the ſubject, and ſtill leaving us as uncertain as before. Perhaps more is contained in that book than any where elſe; but there is ſcarcely a page in which I cannot ſee faults, in which I cannot point out errors. There are two other authors from whom

materials may be drawn; Gaubius, in his Pathology, and Senac, in his treatiſe *Du Cœur*. Even in theſe, however, the materials are involved in obſcurity, or error. Formerly I intended to have taken Gaubius for a text, but I found I ſhould be ſo often engaged in criticiſm, that it would have been very diſagreeable to thoſe who are engaged in the beginning of ſtudy. I do not pretend to correct the errors of theſe writers, but only to point out what I think is fully eſtabliſhed on the ſubject. All the fluids in animal bodies muſt be, if not formally, yet materially preſent in the common maſs of blood. In conſidering this, then, we conſider the foundation of all the reſt.

In the common maſs of blood three different portions may be diſcerned. Firſt, the coagulable lymph; ſecondly, the red globules; thirdly, the ſeroſity. Theſe three portions are conſtantly obſervable in the blood of animals. There are, indeed, a ſet of animals called the *Exſanguia*, but I find that there are very few of theſe, even thoſe of the inſect tribe, but what contain more or leſs of the abovementioned portions. Although theſe be the proper conſtituent parts of animal blood, yet it muſt be allowed there are ſeveral others occaſionally preſent, as, *e. g.* a quantity of unaſſimilated chyle, and, though not ſo conſtantly, a quantity of reabſorbed ſecreted liquors, either of thoſe intended to be thrown out of the body, or of thoſe ſecreted into particular cavities, for particular purpoſes. Beſides theſe, there may be, on various occaſions, a number of extraneous matters, not capable of being converted into animal fluids, taken in with our aliment, or given in the way of medicine, *&c.* which are conveyed out of the ſyſtem, as ſoon as the laws of the œconomy admit. Theſe we ſhall talk of afterwards. At preſent we proceed to conſider thoſe principal portions we have mentioned; and firſt,

COAGULABLE LYMPH.

This was firſt taken notice of by Malphigi, under the title of the *Pars fibroſa ſanguinis*, and is what Davies and others call the *Gluten*.

Gluten. I keep to the term impoſed by Senac, before whoſe writings it had not been taken notice of as a conſtant conſtituent part of the blood. That it is always preſent, is ſhown by eaſy experiments, by waſhing the *craſſamentum*, by agitating the blood drawn from veins or arteries in a cloſe veſſel, and pouring off the other parts from it, and by coagulating the ſerum. It is alſo found both in the diſeaſed and healthy, appearing in the form of what is called inflammatory cruſt.

From examining it, in conſequence of the experiments above-mentioned, it appears to be that portion of the blood moſt diſpoſed to concrete upon ſtagnation, or cooling of the whole; and, therefore, the foundation of the concretion in extravaſated blood. From concreting along with the colouring parts, it has commonly eſcaped the notice of Phyſicians. When freed of this colouring part, it appears more or leſs white, perfectly mild and bland, reſembling, in ſenſible qualities, and chemical principles, the *albumen ovi* of oviparous animals; whence I conclude them to be entirely the ſame ſubſtances, only that the coagulable lymph can never be got ſo accurately ſeparated, as the *albumen ovi*. As that ſerves for the nouriſhment of the chick, ſo the coagulable lymph is the nutritious part of animal fluid, that into which our aliment is converted, and that in conſequence of whoſe changes the ſolid parts of the body are formed. This is confirmed when we compare it with animal ſolids, which, upon chemical trials, and other appearances, are evidently one and the ſame kind of matter. The coagulable lymph is chiefly acted upon, or undergoes changes, in conſequence of heat, cold, or putrefaction. It is not to be changed by any ſubſtances which can be taken into the veſſels of animals conſiſtent with life. It is, indeed, affected by concentrated acids, cauſtic alkali, and neutrals, but never with theſe when taken in by the mouth, and when injected into the veſſels they produce death.

2. RED GLOBULES.

By former Phyſiologiſts theſe were conſidered as a very great proportion of our fluids; but are now found, in compariſon with the whole, to come in but for a very ſmall ſhare. In other reſpects they are not near ſo much the object of our attention as formerly; for the Lewenhoeckian doctrine now is entirely exploded, which no obſervation, even with the microſcope, has confirmed, and which every later obſervation contradicts. Every experiment proves them to be a diſtinct part of the blood.

The chief property of red globules is, that they refuſe mixture, and are only diffuſed in the other parts. With the ſeroſity they even admit not of diffuſion; and though joined to the coagulable lymph, yet is there no intimate union, and the two portions can be eaſily ſeparated without decompoſition. It is on account of this want of miſcibility, that they appear in a globular form, in the ſame manner as oil in water, or, if the oil be in greater proportion, water in oil. We never can ſee the ultimate particles of bodies; and whenever we ſee a globular appearance in mixed bodies, we muſt conclude it is only in conſequence of diffuſion. Gaubius ſuppoſes the red globules of an oily nature; but their more ready diffuſibility with water, preferable to the ſerum or coagulable lymph, contradicts this opinion. Neither, indeed, will they unite with oils, which holds true with no other oily body I know. It has been ſaid they are inflammable, and give out much oil in diſtillation; but againſt this it may reaſonably be alledged, that thoſe who made the experiment were not ſufficiently accurate in ſeparating them from the other parts. Thus we have ſaid what the red globules are not, I wiſh we could ſay what they are. We have called them globular, but Haller and Senac diſpute about this, the one calling them globular, the other lenticular. Another queſtion has ariſen, *viz.* Whether every ſingle globule is of a red colour; or whether they only attain that when placed in a quantity above each other, in the ſame manner as happens in tinged glaſs,

glaſs, which, if divided into thin films, becomes tranſparent and colourleſs; but if theſe tranſparent colourleſs films be laid above each other, the ſame colour as formerly again appears. Haller ſays, that the globules have ſingly their red colour; Senac the contrary. We may allow to Senac, that if the ſingle globules are red, they are but faintly ſo, and that it depends chiefly on the admixture of the whole; and that the deepneſs or brightneſs of the red depends on the diffuſion or concentration of the red globules. I am inclined to think of their ſeparate red colour; for in very ſmall proportion they give colour to a large quantity of water. The nature of this part of our blood depends ſo much on microſcopical obſervations, and theſe are ſo liable to error, that we cannot depend upon one particular which has been ſaid concerning it. It is ſaid that the red globules remain not only of the ſame ſize, in the ſame animal, at different times, but in all different animals at all times. If this were true, it would be very difficult to account for; but I imagine the fact is not accurately eſtabliſhed. Whether the colour of the red globules is heightened or leſſened by particular circumſtances, and what is the reaſon of theſe changes, is a great *deſideratum*; but not determined. That they are changed by putrefaction, may be allowed; but that ever their ultimate particles are changed, require confirmation, or that any medicines exiſt which have the power of altering their colour or form. In ſhort, how the red globules are produced, to what purpoſe they ſerve, in what proportion they exiſt, and by what powers they are altered, ſeems altogether unknown.

3. SEROSITY.

Allowed to cool, the blood ſpontaneouſly ſeparates into *Craſſamentum* and *Serum*. Theſe are commonly thought homogeneous, but it is found the *Craſſamentum* is compounded of the two laſt parts which we have mentioned, and the *Serum* of the *Lympha coagulabilis*, and the portion which by Senac has been properly called Seroſity, or that watery part which runs out of the pores of the cut *Serum* when coagulated. It is obſerved, that, when warm, the Se-

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rum ſhews both a taſte and odour, which experiment finds to be owing to the ſeroſity, which conſiſts of pure water with ſaline matters diſſolved, and probably a portion of an oily matter adhering, and which is found to poſſeſs the taſte and odour mentioned, more or leſs ſtrongly, in proportion as it has been accurately ſeparated from the coagulable lymph. The Seroſity, then, is to be conſidered as a ſeparate part of the blood, and from many circumſtances it appears a-kin to the urine in the kidneys, and to be properly the excrementitious part of the blood. As putrefaction renders volatile, ſaline and oily matters, it is no wonder how they come to exiſt in the ſeroſity. It is theſe which probably fly off in the *halitus ſanguinis*, which is not, as ſome have imagined, a diſtinct part, but found by experiment to be of the ſame nature with the Seroſity. Whether a peculiar matter flies off along with the Seroſity, is not ſo eaſy to decide. Experiments ſhew, that air is contained in the blood, but whether this be common or fixed air, is not determined. Shut up accurately in cloſe veſſels, the blood remains remarkably fluid for a long time. Air is, in ſome meaſure, the foundation of fluidity in water, and on both theſe accounts may perhaps be ſuppoſed the foundation of fluidity in our blood. The only author from whom you will, perhaps, gain any knowledge on the Seroſity of the Blood, is Mr. Senac.

With regard to the union of the Seroſity with the other parts of the blood. It pretty manifeſtly does not unite with the red globules. I ſaid that the red globules were waſhed out with the Serum, but then they very ſoon precipitate to the bottom. How far the Seroſity unites with the coagulable lymph, is not ſo certain. It is plain that a portion of the coagulable lymph ſpontaneouſly ſeparates from the Seroſity, to form the *craſſamentum*, but then another part goes along with the Seroſity; but I imagine there is never between them a perfect union. The Seroſity is always acrid, and whatever ſubſtance, therefore, it is mixed with, it muſt communicate that acrimony to; but the coagulable lymph, ſeparated from the Seroſity, retains no ſuch property. Again, when we coagulate the Serum, we find

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the Serosity run out from the pores of the coagulable lymph, which shews that it was only entangled in the same manner as the fluid volatile alkali coagulates with spirit of wine. From this view we would be led to imagine, that the three parts of the blood are never joined by proper mixture, but only kept in union by motion and agitation. If this be confirmed by useful purposes deduced, as thence accruing to the animal œconomy, it will appear more certain. The Serosity seems designed to take off the putrid parts of the blood, and to furnish the excrementitious secretions. If a proper mixture should take place, it would take off the nutritious coagulable lymph along with it, which we could not conceive to be separated by the secretory organs. Again, the Serosity seems to hold any occasional matters which may exist in the blood, and which, by this means, are soon carried off by the secretions, but otherwise would alter the nature of the animal fluids. This shews that matters, introduced into the mass of blood, can have little effect in altering it, but may be, as they actually are, soon discovered in the secretion.

There is a portion of matter pretty constantly present in the blood, *viz.* the oil which must have been secreted from the common mass into the cellular texture and reabsorbed. How this exists in the blood is not determined; whether united with all the other parts of the blood before-mentioned, and separated by the secretory organ; whether formally as well as materially present; or whether joined with the serosity. It is this last opinion I am apt to favour, for we find often the oil formally present in the urine; we find, that in a due quantity the oil will act as a demulcent, and will take off, *e. g.* the acrimony of the mucus in the bronchiæ, whence we would be led to conclude, that it is designed by nature to obviate the acrimony of the serosity. Wherever there is a tendency to putrefaction, there the acrimony of the serosity is encreased, and there consequently would be more occasion for the oil as a demulcent. Accordingly we find, that in ninety-nine Fevers of an hundred there is an emaciation and an absorption of the oil in the cellular membrane.

May we then conclude, that thoſe we have mentioned are the only conſtituent parts of the blood, or are there ſtill others? It has been ſuppoſed by Haller, Gaubius, and Senac, that there is a *mucous matter* ſimilar to the vegetable mucus; and the latter alſo ſuppoſes what he calls a *gelatinous matter*. It will be proper to take notice of their arguments. We are daily taking in a quantity of vegetable aliment, which furniſhes a vegetable mucus, which may paſs through the *primæ viæ* unchanged, and exiſt in the maſs of blood. Indeed this ſeems to be the caſe; but then this mucus floats in the ſeroſity without furniſhing any nutritious fluid, and ſo is thrown out of the body. By theſe Gentlemen it has been ſaid to furniſh the mucous ſecretions. If you look into Dr. Fordyce's *Theſis de Catarrho*, you will find the ſecreted mucus has a great reſemblance to the coagulable lymph, from ſome experiments, which indeed were made with a view to this very queſtion; a portion only of the ſeroſity being mixed along with it; and indeed every view of this ſubject ſeems to confirm what is ſhewn by theſe experiments. As a foundation, indeed, for his opinion, Senac alledged, that the mucus is preſent in the maſs with the ſame qualities as ſecreted. He took a ſtomach, and emulged from it a conſiderable quantity of mucus, more, he ſays, than could be contained in the follicles, and which, therefore, he concludes muſt have been drawn directly from the blood. But who determined for Senac the capacity of the follicles of the ſtomach, or ſhewed him, that, though that was not great, it might not be compenſated by their number? Again, in any irritation applied to the excretories, the mucus runs out in a fluid ſtate, and it is only in conſequence of ſtagnation, that it attains its viſcid conſiſtence. Hence, then, we are led to think, that any mucus Senac obtained from a dead animal, was only in conſequence of its having ſtagnated in the follicles of the ſtomach. Beſides, Senac always ſuppoſes the mucous matter to exiſt formerly in the maſs of blood, whereas it is much more probable that it is changed in the ſecretory organs.

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As to the *gelatinous matter*, it may be more ſhortly diſcuſſed. Senac only infers the preſence of this matter, from the nature of animal ſolids, which are made up of the fluids, and are reſolved into a jelly different from the coagulable lymph, which jelly he concludes thence muſt exiſt in the blood. But we never can perfectly extract animal ſolids; nay, as in the caſe of vegetables, there is always a ſucceſſive ſolution and decompoſition, as will appear ſufficiently evident from the experiments of the Bologna Society, and of Geoffroy; ſo that ſtill we may admit that animal ſolids are compoſed of the coagulable lymph, although by reaſon of the decompoſition which enſues, we cannot extract it.

Having thus aſcertained the *conſtituent parts* of our blood, it would be of advantage to determine the *proportion*. This, however, cannot well be done. Although only diffuſed or entangled, it is very difficult to disjoin the parts of the blood, the ſeroſity entangling and being entangled in the coagulable lymph, and that again concreting with the red globules; and although theſe parts may be ſeparated, yet never can the ſeparation be made with that accuracy ſufficient to determine the proportion. Haller, when he examines the quantity of cruor, has no notion of its entangling the ſeroſity; and, in ſhort, all the experiments which have been made before it was known of what parts the proportion was to be aſſigned, muſt go for nothing. *En gros*, the red globules ſeem to be in ſmalleſt proportion, and the ſeroſity in greater than the coagulable lymph.

Here, then, we muſt conſider the changes the blood is apt to undergo, by ſpontaneous or artificial ſeparation. Nothing is more common than to judge of diſeaſes by the appearance and ſeparation of the blood; but when we conſider the variety of circumſtances which influence this ſeparation, the ſize of the orifice, the manner in which the blood flows, the ſhape and capacity of the veſſel which receives it, the temperature of the air at the time, the air in which the blood is allowed to ſtagnate, &c. we muſt eaſily ſee that

our judgment muſt be very fallacious, when which of theſe different cauſes affects the ſeparation at the time, is ſo difficult to aſcertain. Brown Langriſh has made many experiments to determine the judgment to be formed of diſeaſes from the appearance of the blood; but as he could not, and certainly did not, beware of the cauſes, which varied the blood's appearance, I maintain his experiments muſt go for nothing. May we not alſo ſuppoſe, that the blood in the veſſels is affected with very ſmall changes, while the real nature and condition of the fluids is not altered? Senac gives us an inſtance of blood flowing ropy from the vein, without its appearing that the patient laboured under any diſeaſe. Again, a ligature kept on a veſſel for ſome time, will produce that inflammatory cruſt, which has always been conſidered as a morbid ſtate of the blood. I had a patient affected with an Epilepſy, who had been accuſtomed to have blood drawn before the fit, at which time it appeared of the natural condition, but in an hour after, in the time of the fit, the blood drawn concreted without any ſpontaneous ſeparation. Upon the whole, it will appear, that our judgment, with regard to the ſtate of the fluids, is at preſent upon a very uncertain footing.

I have ſaid, the Seroſity is a watery fluid, and therefore not apt to concrete, eſpecially on account of the ſaline matters diſſolved in it. The red globules ſhew no concreting diſpoſition, and it is therefore only the coagulable lymph, which, in its own nature, is ready to concrete. It will be therefore next curious to enquire, what are the means in the living body which prevent this concretion, and allow its paſſage through the minuteſt veſſels. 1. From the view of the proportion, we may perceive that the diffuſion of the more fluid parts will prevent the concretion of the reſt. 2. Whatever preſerves the mixture, preſerves the fluidity. This preſervation will then depend on agitation, and the action of the veſſels. How much theſe take place, appears from experiments out of the body. If blood is kept in conſtant agitation, even below the animal heat, the fluidity will be preſerved. 3. We muſt take in, as a preventer of concretion, the degree of heat in animal bodies, which, with a certain

certain degree of motion, and close vessels, always take place in the animal œconomy. Here we would be apt to rest in explaining the fluidity in the mass of blood, but I am sorry to say it, still upon imperfect foundation. If we agitate vehemently blood in close vessels, the coagulable lymph is separated, and the other parts may be poured out from it. This coagulation even takes place in animal bodies, even when life and the natural heat subsists. We constantly find it in aneurismal sacs, and often taking place in the heart, under the name of *polypus*. However, I am apt to think these *polypi* do not so often take place in living healthy bodies as is imagined, but are formed in the agonies of death, or immediately after it. Still, however, there are instances of their continuing for a length of time; *i. e.* instances where all the circumstances we mentioned as preserving the fluidity take place, and yet a concretion obtains. This is very difficult to explain. Perhaps this may illustrate it. It is a curious fact in chemistry, that when two bodies are joined by solution, or diffusion, more particularly by the first, as in a saturated solution of salt, the crystallization will not take place, except where there is a contact with some third body, *viz.* the air, body, bottom, or sides of the vessel. Thus we see that if a dry body is put into the blood, a considerable concretion will be formed upon it, as in the whisking of the blood with rods. Hence we are furnished, besides ligatures, with another means of stopping hæmorrhage, and it is by furnishing an opportunity to this concretion, that *charpie* acts, and probably agaric, whose fine fibrous texture gives an occasion to the separation; for which reason, I imagine the scrapings of a hat would answer the same purpose. This same fact bears a curious application, and seems probably to be the reason of the separation of saline matters and air from water, upon filtration through sand.

But to proceed; this concretion does not take place in our vessels because there is never a dry body in contact with them, a thin fluid, oozing out from their side, continually moistening them, of the same nature perhaps as the serosity, and repelling the particles of the blood.

blood. But why does not the coagulable lymph concrete to the ſides of veſſels applied to receive the blood? Becauſe, probably, the heat preſerves the fluidity for a little, and the ſeroſity gets itſelf interpoſed; but wherever there is a dry contact the concretion takes place. This dryneſs happens in the veſſels, as in the caſe of Inflammation, and probably alſo in aneuriſmal ſacs; and hence it is that I imagine, where *polypi* are found they are owing to a previous Inflammation. All this, however, is not ſufficient. Other concretions take place, and I ſuſpect, that a violent agitation, produced in a particular portion of the blood, may produce them. Hence, then, concretion is not a conſequence of the ordinary circulation, becauſe there the powers are ſo directed as to preſerve the proper mixture and proper fluidity; whereas, in the agitation of a particular part of the blood, I conceive the ſerum taking hold of the red globules, and allowing the lymph to concrete. But even in the progreſſive motion, it is poſſible the agitation may go ſo far as to give occaſion to the concretion of the ſaid lymphatic part. In a healthy perſon, this does not take place, and the coagulable lymph does not ſeparate from the red globules, but when violently agitated by inflammation the lymph gets up to the ſurface and concretes by itſelf. This inflammatory cruſt is no new matter generated by the inflammation, as ſome have imagined, nor is it then preſent in greater quantity. No experiments have been adduced to confirm theſe opinions. I have ſaid, that it was very difficult to aſſign the proportions of our blood, and therefore this queſtion ought properly to remain in doubt, as belonging to that head. In ſpite of this, I believe we may take upon us to determine; for when this inflammatory cruſt is ſeen, the *craſſamentum* is in leſs quantity and not ſo firm. Neither, indeed, can we conceive in what manner ſuch new matter can be generated. If a ligature produce the ſame appearance, we cannot imagine it ariſes from any change of aliment. As the ſeroſity is furniſhed by the coagulable lymph, and as we know ſo little of the red globules, we cannot ſuppoſe, or at leaſt explain any change in the latter part, which ſhould convert it into coagulable lymph, or in order to the ſame purpoſe, any retrograde change in the ſeroſity. It

may

may here be aſked, whether or not this cruſt is encreaſed in denſity? This I would deny; for in its ſpontaneous ſeparation it never appears of greater denſity, than when procured in the ordinary way. Nay, the force of coheſion in the particles of the coagulable lymph ſeems rather diminiſhed, which gave occaſion to the ſeparation. In putrid Fevers, and ſcorbutic caſes, this cruſt is very frequent, and there, as in other caſes, depends on ſome change of the lymph, which cauſes an eaſy ſeparation. The appearance of this cruſt is commonly, and may be taken as a ſign of inflammation; but it is by no means an univerſal one; for in healthy perſons it will remain for a length of time, as, *e. g.* in the caſe of child-bearing women. In Fevers, where there is no topical inflammation, the cruſt has commonly been ſuppoſed an indication of inflammatory diatheſis, and of blood letting. I would allow this, in ſo far as we allowed the inflammatory cruſt as a ſign of inflammation. Formerly I uſed to employ this appearance as a mark, whether a Fever was nervous or inflammatory; and, indeed, it often anſwers; but now I find that it is not a conſtant mark, and that the Fevers, in which it appears, would often be the worſe for having the evacuation puſhed, and were of the nervous or putrid kind.

Having now ſpoken of the conſiſtence of our fluids in health, we proceed to conſider their morbid variations, with regard to the two heads marked out in the Catalogue, of *Attenuants* and *Inſpiſſants*.

When we conſider the ſubtile veſſels, through which the circulation is to be made, we would think, that only a fluid of extreme exility was fit for it; but we find that our fluids, which are far from being of a perfect diſpoſition, are capable even of filtrating along the ſides of the ſimple fibres, through pores inconceivably ſmall. There is, then, adapted to each animal a certain degree of fluidity, which muſt be placed as a ſtandard, from which deviations on either ſide may be produced. Where the conſiſtence is thicker than the natural, we call it lentor, where thinner, no technical term has been applied.

Proper

Proper conſiſtence ſeems to depend, firſt, on the due proportion of the parts; ſecondly, on theſe parts being kept accurately diffuſed together; thirdly, on the due force of coheſion in the conſtituent parts to each other.

1. *Due proportion of the ſeveral parts.* In order to produce lentor, we ſhould conceive this chiefly to ariſe from an over-proportion of coagulable lymph ariſing; 1. from a large proportion of aliments, or convertible parts, thrown into bodies of ſtrong and rigid ſolids, we might ſuppoſe this encreaſed quantity of coagulable lymph to take place; and, in fact, different proportions ſeem to be in different animals, and if we examine them in groſs, we ſhall find, that the denſity of the blood is in proportion to the ſtrength and vigour of the ſolids, and therefore in proportion to the different age and ſex, and theſe being given, to the different temperament with regard to rigidity, *&c.* but, as ariſing from theſe cauſes, lentor will ſeldom be a diſeaſe. Rigid and robuſt ſolids require a ſtrong and denſe blood as a balance, nor indeed do I think it ever probable, that the natural powers can produce a diſeaſe. We may indeed ſee, that the coagulable lymph is in greater proportion where there are denſe ſolids, but then the greater action of theſe ſolids will prevent its concretion. Again, wherever the coagulable lymph is encreaſed, it has the power of inviſcating the other parts, of preventing the ſecretions, and thus obviating the effects of lentor. Although, however, we ſhould allow, that an encreaſe of animal nouriſhment in weak perſons may produce an encreaſe of coagulable lymph, yet even here the conſiſtence will not be much varied, for it will be counterbalanced by increaſed putrefaction leſſening the coheſion. The ſame effect will be produced, if at any time the ſecretions be diminiſhed; for then the ſaline parts will grow ſtill more and more putrid, and occaſion an immediate fluidity of the whole. Farther, an over-proportion of coagulable lymph is always accompanied with thirſt, by which means a greater quantity of fluid will be thrown in to obviate the denſity. Upon the whole, there is little reaſon to ſuppoſe the animal powers can produce lentor from encreaſing coagulable lymph,

nor

nor indeed do we know any matter which particularly furniſhes coagulable lymph, or that it can be procured by any means, but from our aliment.

What next will vary the conſiſtence, is the proportion of ſerum. This may take place, either from too great an abſtraction, or from its being kept back. With regard to the laſt, as the diminution of drink diminiſhes all the fluid ſecretions, its want is compenſated. It may act alſo in another way. The fluid accompanying our aliment promotes its ſolution: The leſs of this, therefore, we take in, more fæces are produced, and conſequently leſs coagulable lymph is carried into the blood, ſo that in either way, no encreaſe of the blood's denſity is produced. I think this is confirmed by experience. I know many perſons, eſpecially thoſe of the female ſex, who take exceedingly little drink, and yet their blood it not more denſe than that of other people; and the ſame thing I have found to take place with myſelf, and, therefore, I think perſons, in this reſpect, may be allowed their own choice, without ſuſpicion of any bad conſequences, except what may ariſe from the vigour of the ſolids. Another counterpoiſe to the keeping back of fluid parts is, that the fluid ſecretions are diminiſhed, as the urine and perſpiration; from which retention of the ſaline parts, a putreſcency takes place, which compenſates entirely the effect of the diminution of drink on the conſiſtence. Next, with regard to the abſtraction of the fluid parts. In the living body there is no halitus, but this is made up by ſecretion. Nothing is more talked of by Phyſicians, than by the diſſipation of the more fluid parts, an inſpiſſation of the reſt; and yet I am of opinion, it very ſeldom takes place. The moſt conſiderable fluid ſecretion is that of urine, not, indeed, greater than perſpiration, but more conſiderable, as made from a ſmaller portion of blood. Let us ſuppoſe ʒj. of blood goes through them * at every pulſation of the heart, which let us ſuppoſe ſixty-four times in a minute, then

* The kidneys.

will ℥viij. of blood paſs through the kidneys in a minute, which is a very moderate calculation, conſidering the proximity of the emulgents to the heart, and xxx℔. in an hour. From this quantity let us ſuppoſe ℥iv. of urine in an hour to be ſeparated, which is a great proportion, making vi℔. a day, then will the whole quantity ſecreted be only an hundred and twentieth part of the blood which ſecreted it, which can very little alter the conſiſtence. When ſuch is the caſe in the ſecretion of urine, where ſo much is taken from ſo little blood, much more will it take place in other more diffuſed ſecretions. But when are the ſecretions encreaſed? When there is a conſiderable quantity of fluid taken in. Again, when the ſecretions are encreaſed, the encreaſe of one is always followed by the diminution of another, and the body becomes in an abſorbent ſtate, and attracts moiſture from the air. Again, encreaſed ſecretion is always followed by thirſt, and then a ſupply of fluid is thrown in, or, if we are prevented from drink for any length of time, it never miſſes to diminiſh the ſecretions. Hence, then, diſſipation of the fluid parts can have little effect in producing lentor.

The ſecond cauſe of Lentor may be aſſigned *Defect of Motion*, or the moving power. To this purpoſe it may be obſerved, in the firſt place, that if blood be received and kept in cloſe veſſels, it retains as much fluidity as is conſiſtent with the cold to which it is expoſed, ſo that without exhalation, the fluidity is not much altered, and accordingly in the ſmaller veſſels of a dead body the whole was fluid almoſt as in the living. Sometimes, indeed, in the larger veſſels we do find coagula, but theſe are owing to particular cauſes, *e. g.* agitations in a particular part, or the agonies of death. In fact, we have not much to ſuſpect from ſmall ſtagnation, unleſs ſome other circumſtances concur to favour ſome ſecretion; or if concretion ſhould take place, fluidity is ſoon reſtored by the action of the containing veſſels, as in perſons recovered from a long ſyncope. This is moſt remarkable in the ſleeping animals, whoſe fluids actually concrete during the winter, and are reſtored to fluidity

fluidity by the vernal warmth exciting the action of the veſſels. Van Swieten clearly ſhows, that in a bat's wing, which he examined, the firſt change was produced in the ſolids, and that the grume accompanied their motion till it was totally diſſolved. Formerly we imagined, that when fluids were concreted beyond the veſſels, as in Cancers and Scirrhoſities, that the diſeaſe was incurable; but late experience has happily ſhown this to be a miſtake, and awakes our remembrance to other facts of the ſame kind, long ago alledged. Such are the proviſions we ſee afforded by the animal œconomy, in order to avoid diſeaſe, inſomuch that hope need not fail us while life remains. Even when the blood ſtagnates in ſuch a manner as to favour concretion, as in Ecchymoſes, falſe Aneuriſms, *&c.* we ſee there are undoubtedly ſome powers in the animal œconomy, which reſtore fluidity, and cauſe abſorption.

The third cauſe of Lentor may be *an increaſed Force of Cohesion* in the coagulable lymph, or in any other part of our blood. This may ariſe, firſt, from the nature of the fluids themſelves; or, ſecondly, coagulable ſubſtances applied; or, thirdly, coagulating powers, as cold. The firſt may take place in conſequence of difference of aliment, and vigour of the aſſimilatory powers; but in ſo far as encreaſed coheſion ariſes from theſe, it is never a diſeaſe, for it is always in proportion to the ſtrength of the ſolids. But aliment may be conſidered in another light, according to its perſpirability; *e. g.* Oyſters are more unperſpirable than mutton, which is explained from their greater viſcidity in the blood. How far this may go on in producing a viſcidity of the whole maſs is uncertain. If the ſame aliment be not continued, the effect is ſoon over; if the aliment is continued for a length of time, a diſeaſe indeed is produced, but then the retained perſpiration obviates the viſcidity, which would be apt to occur, by cauſing putrefaction; and therefore it is a Scurvy, and not a Lentor, which we muſt apprehend from too viſcid aliment.

The ſecond means of encreaſing coheſion was, by coagulating ſubſtances introduced into the blood. Theſe Boerhaave enumerates in his *Coagulum acidum ſpirituoſum et auſterum*, under the laſt comprehending Metallic Salts, *&c.* All theſe, when diluted, loſe their coagulating property, and without dilution they cannot enter into our blood. They can only be given in ſmall quantity at a time, that muſt be diluted before it paſs our fauces, is diluted in every ſtep of its progreſs through the alimentary canal, carried into the lacteals is diluted with the lymph refluent from every part of the ſyſtem, entering the ſubclavian is diluted by the blood, and is thrown out from the left ventricle, diffuſed through all the fluids of the body. It is plain, then, in ſuch dilution and diffuſion, the ſenſible effects of coagulating ſubſtances introduced by the mouth cannot be perceived. Injected, indeed, into the veins, they will exert their effects, but then this is not to be conſidered as a diſeaſe, and, in fact, is entirely incompatible with life. Dr. Boerhaave adds an inſtance of the effects of Gypſum, which needs no animadverſion here. Coagulum, then, in our fluid, from coagulating ſubſtances, can never take place in the living body.

The third means of encreaſing coheſion mentioned, was by coagulating powers applied, *i. e.* Cold or Heat. Why ſuch oppoſite degrees of the ſame power ſhould have ſuch ſimilar effects, it is not our buſineſs here to enquire. The coagulating effects of neither of theſe on our fluids can take place in the living body. Cold cannot coagulate the fluids till it has deſtroyed the action of the moving fibres, and the mobility of the nervous power, to which all its effects are to be imputed. On the other hand, coagulating heat can never take place till it has deſtroyed the whole ſyſtem, or the peculiar part to which it is applied, and it is only in conſequence of reſtoring the action of that part, that fluidity can be reſtored. From theſe conſiderations it will appear, that though we cannot abſolutely deny ſuch effect upon the fluids, yet that it occurs much more rarely than was imagined, and that, when it does, it is not much to be regarded.

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Although not ſtrictly connected with this ſubject of *Lentor*, I cannot help taking notice, that Obſtruction has been conſidered as an univerſal cauſe of diſeaſe. Obſtruction may depend either on the thickened conſiſtence of the fluids, or the ſtraitening of the veſſels. This laſt is what I imagine to be moſt frequent, and from what we have ſaid, I think, it will appear that from the firſt cauſe it very rarely occurs. For this ſubject I refer you to Haller, who alledges, in conſequence of direct obſervation, that Obſtruction at all very ſeldom takes place, and who denies abſolutely the principal ſpecies of it alledged, the *error loci*. In ſhort, it is proved, that Obſtruction without Irritation, is of little conſequence in the ſyſtem. All this applies to the whole pathology of the fluids.

Before I leave this ſubject, of the Conſiſtence of our Fluids, I cannot help ſpeaking of the *phlegma calidum et frigidum* of the ancients, which, indeed, ſome of the moderns have endeavoured to ſupport. By the firſt is meant conſtantly Inflammatory Lentor, ſo that it is plain here, a natural portion of our blood has been miſtaken for a morbid one. If the coagulable lymph thus be the cauſe of the *phlegma calidum*, I deny abſolutely that any ſuch thing as *pituita frigida* takes place, beyond the *primæ viæ* at leaſt. Boerhaave has given us many inſtances of *glutinoſum ſpontaneum*, but you will find they all occur in conſequence of ſecretion, and ſtagnation out of the courſe of circulation, and do not infer the exiſtence of any ſuch matter in the maſs of blood.

Lentor, then, it ſeems to be proved, occurs very ſeldom; but at preſent let us ſuppoſe it poſſible, and conſider theſe medicines which may obviate its production, or remove it when produced, *viz.* the

ATTENUANTIA.

Theſe by ſome have been diſtinguiſhed from Reſolvents, and ſuch do not extend the meaning of *Attenuantia*, as we do to medicines which diminiſh viſcidity in general, but confine it to ſuch

ſuch medicines as dilute thickened fluids; whereas they ſay, that Reſolvents reſtore fluidity to a portion of our fluids by any means concreted. Theſe laſt I would deny the exiſtence of, as none ſuch can have effect in the living body. There are, indeed, reſolving powers, but ſuch are not reſolvent in conſequence of application to the concretion, but in conſequence of action on the moving fibres.

However, as I am not certain whether I can deny theſe altogether, I have ſet down in our liſt ſuch as are ſuppoſed to have theſe properties. Attenuants may be of two kinds; 1. Acting by encreaſing the proportion of fluid parts; 2. By diminiſhing the coheſion of the parts of the blood. Of the firſt kind are only Water and watery liquors.

WATER.

Of this I am only to talk of the internal uſe. Externally, cold Water proves a ſtimulus to the moving fibres, and in the ſame manner acts internally in the ſtomach, overcomes the *plethora quoad vires*, removes that load which an oppreſſed ſtomach gives to the ſyſtem, promotes digeſtion, promotes evacuation of the faces. It is in this way only we can explain a common application of it. Chocolate is a very viſcid aliment, and apt to ſtay long upon the ſtomach; but if the uſe of it be followed with a draught of cold Water, it is eaſily digeſted. The efficacy of cold Water on the ſtomach diffuſed over the ſyſtem, cauſes a determination to the ſurface of the body; and indeed there is no means more effectual in procuring a ſweat, than a large draught of cold Water. This I cannot explain, but may illuſtrate it by the effects of the ſaline draught, which has the ſame effect. Cold Water, too, will anſwer in relieving Vomiting, wherever the ſaline draught is effectual, when vomiting depends on want of determination to the ſurface of the body. The ancients employed cold Water to relieve the vomiting in Intermittent Fevers; and the ſouthern nations ſtill uſe it for the ſame purpoſe. Cold Water has likewiſe been employed in continued Fevers. The uſe of it here you muſt ſtudy in Lommius, and the

the ancients, and in the writings of the Phyſicians of Italy and Spain, who not only uſe cold Water, but Ice Water, and have beſtowed whole volumes on the ſubject. As among the ancients diſputes aroſe, whether hot or cold water ſhould be employed at different times, ſo theſe diſputes ſtill ſubſiſt. What are the limits I cannot determine, from want of experience, and perhaps alſo, from not having conſulted with ſufficient accuracy the authors I have mentioned. Here is, however, one deciſion which I can offer, *viz.* that in inflammatory Fevers, more eſpecially thoſe attended with topical inflammation, as Angina, Pleuriſy, *&c.* cold Water has often bad effects; but again, is uſeful in Fevers of the malignant, nervous, and putrid kind. In the northern countries our Fevers are more of the inflammatory kind, and therefore cold Water is not ſo commonly uſed; but perhaps not merely from the difference of the diſeaſe, but alſo from the Carteſian theory, by which the uſe of warm Water was introduced along with the notion of lentor. However, there are certainly exceptions to this. We every day ſee the country people employ it with impunity, with advantage*, often exciting a ſweat, which produces a ſolution of the Fever. Theſe are the effects of cold Water in the ſtomach, and in conſequence on the ſyſtem. One, however, ſtill remains, whence cold Water is thrown into oily matters, or where oil is diffuſed, as in emulſion, it immediately curdles it, and does not allow the proper diffuſion. Something of the ſame kind ſeems to occur in the ſtomach. I myſelf was once troubled with weakneſs of the ſtomach, inſomuch that oil would not ſtay upon it, but flowed near the upper orifice, and was thrown up in pure oily inflammable eructations. Now when this is gone, I find, upon a draught of cold Water, the oil will ſeparate as before, which can be explained on no other foundation, but that oil does not unite even with mucilaginous matter without triture, but is thus ſeparated by the cold Water.

* This holds true, particularly in Autumnal Fevers, of which the poor are often by this means cured, while the rich go on in their diſeaſe.

As a diluent and ſolvent, the advantage is entirely on the ſide of warm Water, which proves a ſtimulus to the ſtomach, and by expeding ſolution, mixture, and evacuation of the ſtomach, favours digeſtion very much, and hence we muſt deduce the effects of Tea and Coffee for the ſame purpoſe after a full meal. But with theſe effects it produces a relaxation of the ſtomach, whoſe tone is in common to the whole of the ſyſtem, and weakened, produces a tremor, extending the relaxation and heat over the whole ſurface of the body, and producing diaphoreſis and ſweat. In inflammatory Fevers, then, and inflammatory Diatheſis, warm Water is very proper in theſe intentions; but in weak, lax, and flaccid habits is pernicious. Hence in the ſame perſons, beſides the ingredients themſelves, we may ſee the bad effects of Tea and Coffee may alſo ariſe from the warm Water.

In the milder aromatics, with moderate reſtriction, we ſhould ſee the ſame effects of Tea in promoting digeſtion, without their relaxing debilitating qualities. Theſe are the effects of cold and warm Water in the ſtomach, except what regards their emetic property, which properly comes under that head.

Carried from the ſtomach into the inteſtines, their effects are entirely the ſame, becauſe when they have arrived there, the hot or cold Water has gained equally the temperature of the body. The effects of cold water in the ſtomach may be propagated by conſent into the inteſtines, but as taken down and materially preſent there, it differs nothing from warm Water. In the inteſtines, Water promotes ſolution, dilutes the chyle, and the viſcid ſtuff contained in them, and waſhes off the mucus adhering to their internal ſurface; by giving greater fluidity of their contents will favour abſorption, and by encreaſing their bulk the progreſs downwards, inſomuch as ſometimes even to prevent its own abſorption. Given in conſiderable quantity, as in that of a Scots pint, by its bulk it will ſo much encreaſe the periſtaltic motion, as to become purgative. This only can explain the purgative effect of ſome Mineral Waters, which often

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are ſo, merely on account of the dilution in which their ſaline matters are held, and whoſe effects can be encreaſed by encreaſing the dilution. Thus ℔j. or ℔ij. of Mineral Water in which ʒij. of Glauber's Salt is diſſolved, will prove more powerfully purgative, than ℔ſs. in which ʒj. is diſſolved. I am perſuaded, it is a miſtake to limit the doſe of our Mineral Waters of this kind, for we ſee the common people, who pour them down in large quantities, obtain their effects more remarkably, both with reſpect to their purgative as well as other properties. Certainly this of Water is one of the ſafeſt purgatives, acting merely by its bulk, without ſtimulating, inflammatory, or ſedative weakening powers. Abſorbed into the lacteals, Water muſt dilute the chyle and favour its mixture with the lymph; but its effects are much more conſiderable in waſhing out the meſenteric glands, that important part of the lacteal ſyſtem. The Scrophula is now found to be a diſeaſe of the lymph, and often to affect the meſenteric glands, which Water will not only waſh out, but encreaſe the action of their veſſels. Mineral Water and Salt Water are moſt noted for their effects in this diſeaſe, and, conſidering the weakneſs of their impregnation, and the great variety occurring in that where the effects have been found the ſame, we have great reaſon to ſuſpect that a conſiderable part of their virtue is to be imputed to Water. To this purpoſe I ſhall give you a fact. I am ready to believe, with Ruſſel, that Sea Water cures more effectually than Mineral Water; but then from its impregnation it proves ſo purgative, that thence its doſe is much limited. My practice is, both with children and adults, to join an equal quantity of Common to the Sea Water, and I find remarkable good effects from the addition. All this ſeems to prove the action of the Water here to be that of waſhing out the lymphatic ſyſtem.

Carried into the blood-veſſels, Water expedes the freedom of the circulation, and promotes a more free ſecretion; but here there is no danger from its quantity, for it is ſoon thrown out by the ſecretions it promotes. It increaſes the motion of the veſſels, while at the ſame time it opens thoſe of the extremities to give way to the in-

creaſed impetus. It is one of the ſafeſt Stimuli, and, by diluting the ſaline and putreſcent matters in our fluids, checks their inteſtine motion. By one and the other effect, it expedes every ſecretion, as has been mentioned, but more eſpecially the excrementitious ſecretions of ſweat and urine. By expeding theſe, it waſhes acrimony from the coagulable lymph, and diſcharges that acrimony out of the ſyſtem. By diluting the coagulable lymph, it ſeems to facilitate its application to ſubtiler parts, or its filtration along our ſimple fibres. It is a certain fact, that calves, *e. g.* are much more nouriſhed by an equal quantity of milk and water, than by milk alone, which can only be explained from the water producing more eaſy application. We thus conſider the effects of Water on every part of the ſyſtem, and upon the whole, the uſe of it in diſeaſes. We ſhall, in ſome meaſure, be ready to allow, with Hoffman, that the title of *Panacea* more properly belongs to it, than to moſt other medicines.

If any of the following ſubſtances be attenuant at all, it is from diminiſhing the coheſion of the parts of our blood.

ALKALINA.

The title is ſet down as comprehending the ſubſtances marked at *b*, in column of *Antacida*. We muſt here invert the order in which they are ſet down.

Volatile Alkali. This, from its ſtimulus, can be given only in ſuch ſmall quantity at a time, that its attenuant powers cannot be obſerved. Its operation is probably confined to the ſtomach, as a Stimulant and Antiſpaſmodic.

Vegetable and foſſile Alkali. Between theſe there is no difference in medical properties. In their mild ſtate they have no effects, as attenuant in the maſs of blood. Out of the body, in that condition, they do not affect the coagulable lymph; *à fortiori*, not in the ſyſtem. In their cauſtic ſtate, out of the body, they do act upon the blood,

blood, and that very quickly, but all the difficulties we mentioned about the effect of ſubſtances on the blood, take place here; and to theſe an additional one is, that in paſſing the ſtomach, they will always meet with an acid; and ſurely, with theſe diſadvantages, and diffuſed in xij ℔. of ſeroſity, they can make little change in the maſs of blood, in any quantity in which we can introduce them. Concentrated, however, in the ſecretions, their attenuant effects muſt be more conſiderable. Here we ſhould alſo take notice of their reſolvent property, but firſt ſhall mention

QUICK-LIME.

This muſt neceſſarily be given thus cauſtic, in order to have any effect on our fluids. It diſſolves the coagulable lymph, and may be thrown in in greater proportion than alkali, but never can be given in ſuch large quantity as to have any conſiderable action as attenuant. Beſides, it is uſed as a medicine, to obviate acidity, a proof that it is neutralized in the ſtomach; from all which, with the alkali, it may be conſidered as exerting only its power in the kidneys. Both this and Alkali have been ſaid to diſſolve ſtones. *A priori*, we ſhould certainly deny this; *a poſteriori*, we are very certain that in many caſes they do not. Du Haen gives us an inſtance of fifteen hundred weight of quick-lime being taken, beſides many pounds of ſoap, and all without any ſenſible action on the ſtone. Lime-water, however, on the other hand, has been ſaid as undoubtedly to diſſolve ſtones, and calculous concretions of the kidneys, but then theſe are of exceeding great variety, and in ſome the ſolution may be obtained. I think I have ſeen ſuch, where the urine was turbid, with greater quantity of ſandy matter, and matter of a flaky appearance. Here, however, there might be a deception, and a ſlight change of urine might have had the effect; and indeed we muſt allow, that many more experiments are wanted, and better directed obſervations. In many inſtances the pain and ſtrangury are relieved where there is no ſolution; and indeed if we allow that the *Uva Urſi* can operate without that effect, we may admit that Lime-water and Alkali may operate in the ſame manner. Again

we are liable to another fallacy. We argue for the power of Lime-water diſſolving the ſtone, becauſe the urine of thoſe who uſe it will diſſolve the ſtone out of the body, but ſtill we are not ſure that this is owing to the impregnation received from the Lime-water, for the urine at this time contains a volatile Alkali, ſo that we muſt not determine till we have tried the urine of the ſame perſon with or without the remedies. Beſides theſe, we are expoſed to many other fallacies; ſo that, on the whole, we muſt not determine till experiments be repeated with a view to ſay any thing certain on this ſubject.

SALES NEUTRI.

Theſe have no ſenſible effect on the coagulable lymph out of the body, and how they ſhould have it in the body I cannot imagine, both on this account, and the ſmall quantity in which we can exhibit them. In one view, however, they ſeem to be effectual in preſerving, if not in obtaining the fluidity of our blood. Our blood is, in great meaſure, kept fluid by the ſeroſity, and this property it ſeems to poſſeſs, as water impregnated with ſaline matters, for common water will not have the effect. This would make us believe, that ſome neutrals added, and alſo Alkalies, would increaſe the effect; but ſtill I can allow little to it, merely from conſidering the ſmall quantity in which they can be thrown in. If thrown in in a large quantity they will vomit, ſo that we are forced to take them at ſeveral times, inſomuch that one will be acting on the kidneys, while the other is throwing in. The moſt which we can ſuppoſe of Nitre, *e. g.* taken into the blood, is ʒſs. and yet this diffuſed in xij ℔. of ſeroſity, ſcarce gives any ſenſible taſte, ſcarcely any ſenſible action. Of their effects we ſhall talk afterwards.

SAPONES.

Here I mean to talk of the combination of Expreſſed Oil and Alkali. This manifeſtly relaxes the texture of the coagulable lymph, and may be taken in quantity, and then only preſerve the fluidity of the whole. I have known lately a gentleman who took

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it in about the quantity of ℥iij. a day, with whom it came off by urine. Its effects in the Gravel are not certain. We ſhould examine the ſtate of the ſoap when diſcharged by urine, and endeavour to find whether its oil be ſeparated, ſo that the alkali has now become more powerful.

Our liſt of Attenuants, you ſee, is very ſmall. The others mentioned under this head by *Materia Medica* writers have been introduced from inference, becauſe found uſeful in what is called viſcidity of the blood and *pituita frigida*, but we have already occaſion to ſhow that the action of theſe was on the ſolids. Dr. Alſton, in making up this liſt of Attenuants, gives properly thoſe which we have mentioned, and afterwards adds a great many from his liſt of Stimulants. With regard to theſe no body has ſpoke preciſely. If they be ſaid to be attenuant from acting on the fluids, I deny that any experiment ſhows it. If they are ſaid to be attenuant from acting on the ſolids, it poſſibly may be ſo; but I know no man who has determined that degree of their action neceſſary to give fluidity.

We now come to ſpeak of the general titles.

Dulcia. Theſe, at the place referred to, have been conſtantly mentioned as of a ſaponaceous nature; but from what has been ſaid, their effects muſt be very ambiguous. As the foundation, however, of the *Nutrientia*, they may be of ſome avail.

Nutrientia. In ſo far as vegetable aliment gives leſs nouriſhment, it gives leſs coagulable lymph, and conſequently on this account, and as accompanied with a good deal of fluid matter, fluidity to our blood. But I do not know how far this can be carried, for the denſity of the blood depends very much on the ſtate of the œconomy with regard to the ſolids. Thus a robuſt laborious man, who lives on vegetables, will have denſer blood than a fine gentleman, who lives on animal food. Again, vegetables, as

leſs

leſs putreſcent, may remain longer in a viſcid ſtate before they are converted; and it is for this reaſon that they are given in the Scurvy, where denſity and conſiſtence is wanting.

Emollientia. Vegetables of this claſs, as marked in the Catalogue, were ſuppoſed to abound in the ſaline matter, but this is not in any ſuch quantity as to give them any title to a place here.

INSPISSANTIA.

Under the head of *Attenuantia* we have conſidered how far Lentor may take place. We are now to conſider the deviation of the fluids towards the ſide of too great fluidity. This change muſt depend on an over-proportion of fluid aliment, or a diminution in the force of coheſion of our fluids. A defect of motion was ſpeciouſly enough alledged to be the cauſe of Lentor, ſo that an encreaſed motion might be reckoned the cauſe of fluidity; but while the proportion of the parts remain, great motion will not alter it. Fluidity, then, depends chiefly on the proportion, which may be varied in two ways, either by the introduction of a great proportion of fluid aliment, or by the retention of the ſecretions.

1. As to the over-proportion of fluid aliment; if this be perfectly mild, we have mentioned the ſalutary effects that may ariſe from it, as that of encreaſing the ſecretions, by which means the over-proportion would run off. It has been alledged, that, inſtead of being carried out of the body, water may run off into the cellular membrane, and produce Anaſarca or Aſcites. From obſervation I never ſaw a Dropſy ariſing from this cauſe. Univerſally it depends on a conſiderable reſiſtance made to the return of the venous blood, or a defect of abſorption. Hence I would doubt whether ever an over-proportion of fluid aliment could produce diſeaſe. An over-proportion of warm liquors may certainly be hurtful, but then we muſt aſcribe this to the relaxation they induce in the ſtomach, and conſequently over the whole ſyſtem.

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As to the retention of the ſecretions. If we could ſuppoſe this to take place over the whole ſyſtem, the effect would certainly follow, but this we cannot expect; and if the retention is only partial, it will always be compenſated by the encreaſe of other ſecretions.

A faulty proportion may occur from a defect of ſolid parts, by abſtracting nouriſhment altogether, or to a defect of aſſimilation. As to the firſt, it is doubtful how far fluidity may ariſe from this cauſe, conſidering how fruitful the animal œconomy is in making proviſion againſt any ſuch changes. A blood once provided with a due proportion of coagulable lymph is only liable to loſe it by putrefaction, and it is of this that thoſe die who die for want of food. More to be attended to is what we mentioned laſt, *viz.* when the digeſtive and aſſimilatory powers are too weak to convert aliment into proper juice. I am ready to believe this may happen; but the formation of our blood, the effects of motion, *&c.* are ſo little known, *e. g.* whether it would produce viſcidity or fluidity, or whether there be not proviſions to obviate theſe, that we cannot yet ſpeak poſitively on the ſubject. In one other way our fluid may be varied on the ſide of fluidity, by the more denſe parts being evacuated. Such effect might be ſuppoſed to take place in hæmorrhage, but here it is uncertain whether the hæmorrhage operates by abſtracting the denſe parts, or by retaining the ſecretions, and ſo occaſioning fluidity.

2. With regard to the production of fluidity by the diminiſhed force of coheſion in our fluids. Whatever is owing to the weaker action of the digeſtive powers muſt depend on theſe not giving ſufficient ſtrength to the whole, but this diminiſhed force, from what has been ſaid, will depend on defect of mixture when the fluids tend too far to putrefaction.

From whatever ſources this of fluidity may proceed, it will appear they are very doubtful, and therefore that the exiſtence of it is

is not ſo frequent. When it occurs, however, we muſt next conſider how it is to be remedied. This may be affected in two ways; 1. by reſtoring the due proportion of viſcid fluids; 2. by encreaſing their force of coheſion. The ſubſtances proper for the firſt indication are marked under the general title, to be mentioned afterwards. As to the ſecond, the only medicines marked for this head are *Acids* and *Alcohol*. Theſe can never be uſed internally to produce their effect, and therefore are only employed externally in the caſe of Hæmorrhages. As to the ſecond indication, if we can reſtore the viſcidity of the fluids, it muſt be by the *Nutrientia*. The Aſtringents alſo in ſome meaſure belong to the article of Acids.

To the *Nutrientia* we muſt add a number of Demulcents, which, as they contain a mucilaginous matter, may have the effect of encreaſing the viſcidity of the maſs; but then they float only in the ſeroſity, and are ſoon carried off with it.

DEMULCENTIA.

Theſe are medicines which correct the acrimony of our fluids. Changes may be made in the mixture of our fluids when no Acrimony takes place, but this is a ſubtilty not yet eſtabliſhed. Medicines correcting acrimony may be of two kinds, as correcting Acrimony in general, or particular Acrimonies. It is the firſt of theſe which is properly meant by Demulcents, which act not by changing the nature of the Acrimony, but merely by ſheathing or covering it, in imitation of Nature, who has covered our ſolids with a mucus for the ſame intention; for it is the ſame thing whether our ſolids are wrapped up in this mucus, or whether the fluids are mixed with it. Hence all our Demulcents are mucilaginous, or oily matters, or a mixture of both. It is the ſeroſity which is the vehicle of acrimony, in order that it may be carried off by the ſecretions. In theſe acrimony exerts its chief effects, and it is there, too, that our Demulcents are collected, in order to defend the ſecretory organ. But before this I ſhould have obſerved, that Demulcents ſheath the acrimony,

mony, which in the heart-burn affects the upper orifice of the ſtomach, have the ſame effect in the inteſtines, ſupplying the natural mucus, as in the caſe of Dyſentery, and alſo defending the rectum in caſe of very hard putrid fæces, *&c.*

In the blood veſſels, I do not imagine acrimony takes place, on account of the diffuſion, and likewiſe becauſe the veſſels are lubricated and defended from it by a mucus conſtantly exſuding from their ſides. It is in the ſecretions, as we have ſaid, where the acrimony paſſes in greateſt plenty, and exerts moſt of its effects. Hence in acrid urine, the efficacy of our Demulcents, which, carried along in the ſame ſeroſity with the acrimony, defends the kidneys from its effects; and hence in this, as well as other diſeaſes of the urinary paſſages, calculous and nephritic caſes, *&c.* are ſo very uſeful. An encreaſed ſecretion of mucus is always acrid, being poured out from the follicles, before by ſtagnation it has time to become mild. Thus poured out in the *bronchiæ*, it produces an irritation, creates a violent cough, and affects the lungs. Hence, in almoſt all diſeaſes of the breaſt our Demulcents are very effectual in covering the acrimony of the mucus. Fluor albus is nothing more than an encreaſed evacuation of mucus in an acrid ſtate, and hence Demulcents become good palliatives. Nay, ſometimes the diſeaſe ſeems to be continued merely from the effects of the acrimony, and in ſuch circumſtances I have ſeen Demulcents operate a perfect cure. Demulcents are alſo uſeful in the flux of the lochiæ in women. In every hæmorrhage an acrid ſerum is poured out, which in this caſe I have ſeen ſo much, ſo as to excoriate the parts which it paſſed over; ſo that univerſally all hæmorrhages may be continued from the irritation, and ſo univerſally our Demulcents uſeful.

It was formerly a practice, yet continued by ſome, to give *Sperma ceti* to child-bearing women, for which I was at a loſs to know the reaſon; but now ſee, that in large quantity it might have the demulcent property we mention. After menſtruation, I have often known the parts ſore, and by this means an uneaſy irritation pro-

duced, only to be removed by Demulcents, externally or internally applied. It has been imagined that Demulcents, in ſtopping hæmorrhage, acted by inſpiſſating the blood, and hindering it to flow out; but you will eaſily ſee, that it is much more probable that their action is by inviſcating the acrimony which irritates to hæmorrhage. So much for the effects of Demulcents in general. On particulars we have very few obſervations to make.

The three firſt marked in the Catalogue belong to the

ASPERI FOLIÆ.

I do not know whether we can extend the demulcent virtue to the whole tribe. The *Conſolida major* contains ſo much of it in every part of the plant, that it can be prepared into a kind of ſalep.

Pulmonaria has the ordinary virtues of demulcent. *Cynogloſſum* is not ſolely mucilaginous, but has an acrimony joined with it, which makes it avoided as demulcent. It was formerly called narcotic, but this property is ſtill doubted. Sir John Floyer gave it to a dog, in great quantity, without any poiſonous effect. Dr. Hulſe, in Ray's *Hiſtoria plantarum*, tells us it is of uſe in the Scrophula. On the other hand, Moriſon and Blair give us inſtances of its poiſonous property. Blair's, indeed, does not properly apply, as the *Cynogloſſum maritimum* is a different plant.

FARINACEA.

All theſe (and indeed all the *Nutrientia* of the vegetable kind) have more or leſs of demulcent virtue, in proportion as they give out in infuſion or decoction a greater quantity of mucilage, and by this we may judge of the propriety of their exhibition, and the largeneſs of the doſe.

DULCIA.

DULCIA.

It would ſeem doubtful whether theſe belonged to this head, but experience ſhews they are uſeful, and we give Syrup with good effects in Catarrh. The uſe of the *Dulcia* may be collected from what we ſaid of them formerly in the *Nutrientia*, and what will be ſaid of them as *Laxatives*. As to the various kinds, how far they diſtinguiſh them in practice is doubtful. Fine Sugar is leſs fermentable than Honey, but that boiled, and deprived of its acid, is neither more detergent, demulcent, or balſamic, than ſugar. The fruits are demulcent in proportion to their ſweetneſs.

Liquorice. We cannot employ many of our ſweets, becauſe they produce thirſt. If it were true that Liquorice had not that inconvenience, it would be of great uſe, but upon trial, given in the ſame quantity with the reſt, I have found it always to produce the ſame effects, without any remarkable pectoral virtues.

SIMPLE GUMS.

The firſt four of theſe are very uſeful. I can throw in more mucilage of *Althæa* than any other plant, and ſo of Gum Arabic, which is commonly employed in too ſmall a doſe. I give to the quantity of ℥ij. in emulſion, and then only find its proper demulcent effects in the urinary paſſages, where there is moſt occaſion for it. *Starch* is a vegetable ſubſtance, in the ſtate moſt fit to be employed as a mucilage, and I have known it thrown in internally in the dyſentery. Salep ſhould have been ſet down here. Many of our own plants might afford a ſimilar ſubſtance, *e. g. Symphytum* and *Althæa*. *Ichthyocolla* is ſet down as an inſtance of animal mucilage being employed as well as the vegetable. This is one of the ſtrongeſt ſpecies of animal glues. Wherever there is reaſon to dread putrefaction, theſe ſhould not be employed; poſſibly, however, there may be caſes adapted to it. In the *primæ viæ*, where there was acrimony without fever, I have ſeen it given inſtead of Starch in glyſters, and

with good effects, its difficult diffuſibility is the occaſion of its rarer uſe.

The general titles will be eaſily underſtood. Sedatives take off the effects of acrimony, by diminiſhing the ſenſibility of the part. I have put them down here, becauſe they are often ſaid to be demulcent in the ſtricteſt ſenſe. Thus the ſeeds of *Hyoſcyamus* have been ſuppoſed the foundation of its demulcent property; but it is plain they never can be given in ſuch quantity as to produce that effect; and thus *Hyoſcyamus*, as demulcent, acts merely by its ſedative quality.

ANTACIDA.

Animal bodies are formed, both fluids and ſolids of them, from the aliment we take in. No portion of theſe fluids is of any duration in the ſyſtem, but is conſtantly waſhing out, and ſupplied from the aliment. Vegetable food is the only food of animals whoſe changes we need properly enquire after, as all animals either live directly upon it, or on animals who do. The aceſcent matter of vegetables, for it is by that they are chiefly diſtinguiſhed from animal nature, is converted into animal matter in conſequence of powers ſubſiſting in the animal body. Hence, then, vegetable aliment in animal bodies goes through all the ſteps to putrefaction, which, however, in its higheſt degree, never takes place in animal bodies. Hence we are led to conſider animal fluids in three ſtates; 1. a portion ſtill remaining aceſcent; 2. a portion in an intermediate ſtate betwixt aceſcency and putrefaction, or the proper animal fluid; 3. a portion degenerated towards putrefaction. This view leads us to obſerve the morbid deviations, while, on the one hand, our food retains too much aceſcency, or, on the other, is gone too far towards putrefaction. Theſe two acrimonies, the acid and alkaline, are the chief, and perhaps the only ones we can diſtinctly mark. We may, indeed, perceive extraneous acrimonies introduced by foreign means into the body, but into theſe we cannot, nor is it our buſineſs at preſent to enquire.

quire. How far even in the common maſs there may not be a variety of Acrimonies different from thoſe we ſpeak of, I ſhall not ſay; but I maintain that no body has explained or ſhown of what kind they are, in what caſes they appear, and with what ſymptoms they occur, or what ſymptoms they produce; and *de non entibus, ac de non operantibus, fere eadem eſt ratio.* There is yet a more fruitful ſource of acrimony in the body, *viz.* from degenerated fluids being abſorbed, and acting upon the ſyſtem. But to know what acrimonies they would produce, we muſt be acquainted with the ſtate of all the ſecreted fluids, a knowledge we are very far from having attained. Every one of them which has been lately examined, has turned out different from what it was formerly imagined, and till once we are well acquainted with their nature, it is in vain to ſpeak of the changes to which they are liable; ſo that, though we allow an infinite variety of acrimony, certainly we ought not to talk of them ſo confidently as we do. As an apology for this diſcuſſion I may obſerve, that perfection is not to be expected in a ſyſtem of the theory of Phyſic, and that it is neceſſary to point out its errors. I can venture at leaſt to ſay, that acrimony is often accuſed without foundation. No ſooner do we ſee a motion excited in the ſyſtem, than we refer it to ſtimulus, and that to acrimony; but every motion of the ſyſtem can be excited independent of theſe, as in the hyſteric diſeaſe, *&c.* by the paſſions of the mind. This, indeed, may be thought a ſtimulus, but ſurely it is neither of the mechanical nor chemical kind. Acrimony, indeed, does exiſt, but its ſpecies can never be preciſely determined; nay, when it does exiſt, we may neglect it. Thus, undoubtedly, in the Small Pox, and other contagious diſeaſes, an acrimony is certainly preſent; but in the cure it gives us no indication, and we do not regard the acrimony, but the effects it produces. In the ſame manner, in the caſe of poiſons, we obviate their effects, for we very ſeldom know the nature of the particular poiſon. Even when we do know them, it is very ſeldom we can give medicines to correct them. However, there are a few caſes where the indication is to expel the morbific matter; but then this

this is only in a very general way, and by ſuch medicines as bring a total change on the fluids. Upon the whole, then, you will ſee, with what impropriety we amuſe ourſelves with acrimony, ſeeing we accuſe it ſo often without foundation, talk of it with ſo little preciſion, and may neglect it with ſo much ſafety. From all this we ſhall treat only the acid and alkaline, as with theſe we are beſt acquainted.

Acid Acrimony takes place when the vegetable aliment retains its acid nature to a morbid degree. In what part of the ſyſtem does this take place? In the firſt ſtage in the *primæ viæ*, and almoſt only in the ſtomach itſelf. Some have ſuppoſed it goes into the blood, and there occaſions diſeaſes. For my part, I am of a contrary opinion. Even in the inteſtines an acid has never been found, for it is there covered with fluids. As ſoon as it comes out of the ſtomach it is mixed with the bile, and forms with it a compoſition which is the cauſe of its effects in the inteſtines. Much leſs then can we ſuppoſe it in the blood veſſels. I doubt even if the chyle is found there, as ſome alledge, conſidering the mixture it muſt undergo in the thoracic duct and in the ſubclavian. All the chyle ſeen in theſe days in the blood is only a portion of the coagulable lymph, ſeparated by itſelf. Even although we allowed it did take place, in twelve hours it would diſappear; for after that time having elapſed from the taking of food, no milk is ſecreted, ſo that we cannot conceive it having any effect on the conſiſtence or mixture of our fluids. How far a certain modification in the ſtate of our fluids may take place, I will not ſay. Vegetable aliment may, indeed, give a leſs denſe blood, but even that was doubted; but ſuppoſing it did, it would by no means be acid. Dr. Boerhaave is the chief leader of this doctrine, and, in his *Aphoriſms*, talks of an acid milk, *&c.* produced by it, *&c.* The very ſame Boerhaave, in his Chemiſtry, contradicts this opinion, and maintains the contrary againſt Lemery and Homberg. Nay, he goes to an exceſs on this ſubject, and denies an Acid could be extracted from human blood, an experiment ſucceſsfully repeated

peated ſince Homberg, &c. by every ſucceeding Chemiſt. When Van Swieten was publiſhed, I expected to have ſeen the matter confirmed; but if you look into his Commentary, you will find him talking ſceptically upon the ſubject, and giving no inſtances to confirm the allegations of Boerhaave. I ſhall then abſtract entirely from the conſideration of Acid in the blood veſſels, and talk of it only as exiſting in the ſtomach. There it may take place on two footings; 1. When the aceſcent fermentation is of the vinous kind, producing *gas ſylveſtre*, ſpaſmodic pains, &c. 2. where, though the fermentation is calm, ſuch a quantity of acid may be generated as to produce bad effect, uniting with the bile, and cauſing Cholera, &c. Theſe may depend on a variety of cauſes; 1. From an over proportion of aceſcent aliment, which may leave ſo much Acid as to prove a ferment for ſome time afterwards. This cauſe is much conſidered, but of a nature eaſily to be overcome. 2. The fault more commonly lies in a defect of the digeſtive liquors, as an abſtraction of the ſaliva, &c. 3. More frequently ſtill do theſe effects proceed from a weak ſtomach; for by its natural action the aliment is compreſſed, the air generated in the formation inviſcated and reabſorbed. Slow evacuation is another conſequence of a weak ſtomach; and indeed this might have been made a diſtinct head, as Acidity is always greater in the proportion as the aliment is longer detained; and I have ſeen no inſtances of a very ſtrong Acid produced, except where there were ſcirrhoſities of the pylorus, and then it had the effects of mineral acids, eroded linen, &c. Not only is ſlow evacuation thus hurtful by cauſing aceſcency, but alſo by preventing its paſſage into the inteſtines, and being corrected by mixture with the inteſtinal fluids. From all this it appears, that vegetable aliment muſt be more aceſcent, as leſs ſoluble. The weaker action of the ſtomach deſerves particular attention, as ariſing from ſo many ſecondary cauſes, and theſe depending on the conſtitution of the ſyſtem in general, theſe diſeaſes being ſeldom a topical affection, and being produced even by paſſions of the mind, &c. and every encreaſed evacuation of the ſyſtem. In order, therefore, to a cure, we muſt

eradicate

eradicate theſe various cauſes; but our time forbids us now to enter upon ſuch a conſideration, and we are only to talk of ſuch medicines as deſtroy Acidity for the time preſent.

The medicines ſet down under the article *Antacida*, are thoſe which deſtroy Acidity by neutralizing it. Theſe are divided into three claſſes. The firſt contains Earths, the ſecond Alkalines, the third Neutrals, under which is comprehended one compound of another kind.

1. EARTHS.

All the ſet marked at *a*, are *Abſorbents*. They are divided into two faſciculi, the Foſſile and Animal.

Of the Foſſile I have ſet down thoſe employed in our Diſpenſatory. *Lapis calcarius* may remain, though of no peculiar uſe. *Oſteocolla* ſhould be rejected, as ſtrangers may ſuppoſe we have ſome confidence in the virtues its name implies. *Chalk*, when waſhed from its flint, is a pure Abſorbent, perhaps the beſt of them, and preferable to the animal Abſorbents. *Magneſia alba* ſhould have been added to this ſet. It has had a conſiderable reputation as an Abſorbent; and, when neutralized, as a Purgative; but I find it is not more abſorbent than any of the reſt, nor more purgative in leſs quantity; as Chalk or Crabs eyes, given in the ſame doſe, *viz.* ʒij. will have the ſame effect. Therefore it may be neglected.

The Animal Abſorbents are all of a common nature except the *C. C. uſtum*, which abſorbs leſs than any of the others, and for that reaſon has been propoſed to be rejected; but its ſalt is manifeſtly of an aſtringent kind, and therefore it may very properly be retained, to be employed in ſuch caſes where we want an aſtringent joined with an abſorbent power. I do not here ſpeak from experiment.

All

All the others are of common nature and virtues. They differ in ſome meaſure in the quantity of acid they abſorb, but this ſo inconſiderably, that cheapneſs may regulate our choice.

When the preſence of acid in the ſtomach demands the uſe of abſorbents, they may be uſed with freedom, at leaſt we need not limit the doſe for fear of what ſome have imagined, that they ſhall be entangled in the viſcid matter and form hard cruſts; for ſo much does the ſtomach tend towards acidity, that they would ſoon be waſhed out in a ſaline ſtate. We may not, however, go too far in abſtracting acid, which ſeems to take place for good purpoſe in the animal œconomy, *viz.* to obviate the alkaleſcency ſo remarkable in the reſt of the ſyſtem. If this be too much corrected, the putrid tendency will, in proportion, take place. Dr. Pringle has mentioned them, from their ſeptic quality, as miſchievous in dyſentery and putrid fever. His reaſoning is tolerably well founded, but I do not apprehend the conſequence, for it is not a ſmall quantity, nay, not even a large one, of abſorbents, which will hurry on to putrefaction, ſo much acid is continually generated, and we ſee every day perſons of acid ſtomachs take large and repeated doſes of them without producing that effect. Again, when they are joined to the acid in the ſtomach, and neutralized, I conceive them acting like other neutrals as antiſeptic, and correcting any bad effects they produce by abſtraction of acid. In the inteſtines they are purgative, and partly with ſome degree of aſtriction. At all times Abſorbents have been noted as diuretic and diaphoretic, which properties, I believe, they exert in the ſame manner as neutral ſalts. Carried into the blood, and paſſing by the excretories, they are in ſome meaſure diuretic, and there are more eſpecially aſtringent. Liquid ſhell, a combination of the muriatic acid with a calcarious earth, I have employed in nephritic caſes with a manifeſt alleviation of the ſymptoms. I ſuſpected a ſolvent power, but found none ſuch out of the body, and therefore thought my ſucceſs imagination. But now that I find other medicines have the ſame property without affecting

the ſtone, I make no doubt of its action, eſpecially as abſorbent earths have had the ſame property aſcribed to them, and thoſe could never reach the kidneys without being joined to an acid in the ſtomach.

2. ALKALINES.

In talking of theſe mentioned in our Catalogue, we ſhall, in ſome meaſure, invert the order of inſertion.

VOL. ALKALI,

from its ſtimulus cannot be given in ſufficient quantity to prove abſorbent, and its other properties have been already mentioned.

CALX VIVA

is placed among our Alkalines, as agreeing with them in ſeveral properties. Its anti-nephritic and lithontriptic virtues have been already mentioned. Its other properties may be ſhortly diſcuſſed.

Externally it diſcovers ſomewhat of an aſtrictive quality, and ſo is uſeful in lax and flaccid ulcers. Whether there it has any effect as an Antiſeptic I cannot ſay. In the ſtomach its chief effects are as an Abſorbent and Solvent, correcting the too great viſcidity of the mucus. I have ſaid, that Arthritics and Nephritics are liable to diſorders of the ſtomach. Lime-water relieves ſuch diſorders. Some would alledge this to be in conſequence of a farther operation in the ſyſtem, but to me its operation ſeems to be in the ſtomach, depending on its ſolvent, abſorbent, and aſtrictive power. In the inteſtines it acts as aſtrictive, and ſo has been found to ſtop obſtinate Dyſentery.

Whether in the blood it is ſolvent I cannot ſay. Paſſing by the ſeveral excretories it may exert its effects; for the reſt I refer you to Dr. Alſton.

As

As accompanied with ſo much common water, which is ſo likely to waſh out the lymphatic ſyſtem, and alſo exerting an aſtrictive property, Lime-water may be uſeful in ſcrophulous caſes; accordingly it has been aſſerted powerful in ſuch circumſtances; but I have never had this property confirmed by experience.

As to any other virtues of quick lime I muſt remain uncertain.

FIXED ALKALIS.

The foſſile and vegetable fixed Alkali have, as far as we know, the ſame effects in medicine; the foſſile is the milder.

Deprived of their air, or in their cauſtic ſtate, they have the power of deſtroying animal ſubſtances altogether; and hence are employed as the common eſcharotic of the Surgeons. The ſtrongeſt Cauſtic is always the beſt, ſooneſt performing what is intended, and I believe with leaſt pain. Prepared by itſelf, it is always fluid in the air, and it has been found uſeful to obtain it in a firm conſiſtent form. For this purpoſe, the preparation of the London College is preferable, and the Quick-lime there added, not only gives a dry form, but preſerves the Alkali in its cauſtic ſtate.

When not ſo cauſtic, but more dilute, it is a fine ſolvent and detergent in various foulneſſes of the ſkin, freckles, morphew, where matter ſticks in the ſebaceous excretories.

It is extremely effectual in waſhing off every thing that adheres to the body, and ſo at firſt gives a nitor and poliſh to the ſkin; but upon frequent uſe, by waſhing out the ſebaceous matter, it leaves it dry, ſhrivelled, and parched.

Dr. Boerhaave employs it as a detergent in ulcers; but in general, except ſuch as are very foul, and covered with cruſts, ulcers do not bear ſaline medicines at all, as they all produce inflammation. Hence the fixed Alkali has been thrown out of our tincture of myrrh,

and aloes mixed with ointments recommended for dreſſing iſſues by ſome. In the ſtomach, fixed Alkali may be abſorbent, but unleſs it meets with ſufficient quantity of acid, it will act as a ſtimulant, ſo that in this intention it is a very uncertain medicine, very apt to be over doſed, not exceeding in this property the abſorbent earths, and not, like them, remaining innocent till an acid be produced to waſh them away. Even as a ſtimulant I do not know but we have properly omitted the fixed Alkali, as in that intention more diffuſible ſtimuli are preferably employed. It has, however, been mentioned as an uſeful ſtimulus to the inteſtines. Boerhaave talks of it as a convenient purgative; but in this view, I imagine, with little advantage; for in ſo far as not neutralized, it proves acrid and inflammatory, and when it is, excels not the neutral ſalts, which are therefore, with juſtice, more generally uſed. Carried into the blood, and collected in the excretories, fixed Alkali proves diuretic; and perhaps there is none more powerful in that operation. It has been employed in various cachectic and eſpecially hydropic caſes. Whether it acts by remaining alkaline, is doubtful. It is certainly proper to combine it with a little acid. In its cauſtic ſtate the fixed Alkali is always moſt powerful, but then it is too acrid. We ſhould, however, take as near to Cauſticity as we conveniently can; and I imagine Practitioners are right in uſing the aſhes of plants; becauſe the Alkali of theſe is in a cauſtic ſtate. It is commonly joined to an acid wine, by which it is half neutralized, and thus may be exhibited in greater quantity. The wine we commonly uſe is Rheniſh. Fixed Alkali may be a powerful ſolvent of mucus, but Lime-water is ſafer, and more effectual.

Huxam accuſes fixed Alkali as producing Scurvy, probably only from theory. It may act, however, by abſorbing acid, and ſo hurrying putreſcency.

3. NEUTRALS.

Theſe I have ſet down, not ſo much for their being abſorbent, as to point out the decompoſition they may undergo.

BORAX

BORAX

has been ſaid to be abſorbent. It has been ſaid to be diuretic, but I have never found it to have that property. In the ſtomach it may be decompoſed by the acid, there be abſorbent, and act as other neutrals. It may be employed, where that is ſafe, to take away *Aphthæ*, which it does very well.

TARTARUS SOLUBILIS

is the moſt agreeable of the neutral ſalts. The French have uſed it, and recommended it. It is found that with the foſſile Alkali it will be got cryſtallized, and it is this which is called *Sel de Seignette*, from its inventor, and has been diſperſed over France as a valuable remedy. But either in one or the other form it is a purgative, little to be depended upon, becauſe all the tartarous neutrals are liable to be decompoſed by the acid in the ſtomach; and becauſe in ſoluble Tartar there is only a ſmall portion of Alkali, and the reſt Cream of Tartar; and beſides, becauſe it cannot be given in ſufficient doſe. As a purgative it is to be conſidered in the ſame light as Magneſia, *viz.* at the ſame time as checking acidity. Poſſibly a fitter ſoluble Tartar might be procured by neutralizing the Tartar with Magneſia.

SOAP,

as an attenuant, has been already mentioned. I have ſet it down here as decompoſed in the ſtomach, and I imagine its reputation twenty years ago, as of ſo much uſe in arthritic caſes, depends greatly upon that. Lime-water, too, may have ſomewhat of the ſame action.

4. GENERAL TITLES.

Acidity can only be radically cured by the *Stimulantia*, which reſtore the afflux to the ſtomach. The Antiſpaſmodics take off the effect of Acidity. Some of the Stimulants, as the Bitters, obviate fermentation, at the ſame time that they ſtimulate and ſtrengthen the ſtomach, the weakneſs of which is the moſt general cauſe of the diſeaſe.

ANTAL-

ANTALKALINA.

There is a doubt whether we can ſpeak of Acrimony as properly alkaline, and perhaps when this exiſts, it is always with deſtruction to the ſyſtem. Du Haen, however, has ſhewn us, that an Alkali may be developed in the ſecretories, as in the urine of calculous patients, whoſe urine effervesced with acids, and turned ſyrup of violets green. But in general, our fluids are only in an alkaleſcent ſtate, and it is to this our medicines muſt be directed. This may occur in any part of the ſyſtem, wherever there are animal fluids. It may even happen in the ſtomach, though, on account of its aceſcent tendency, but ſeldom. More copiouſly it may exiſt in the inteſtines, moſt of all in the common maſs of blood, and the ſeveral excretories. In all theſe caſes it may be conſidered as of two kinds, the chronic and acute; the former in Scurvies, the latter in putrid and malignant Fevers. With regard to the firſt, the nature and cauſes are ſufficiently evident, it ariſing, *e. g.* in conſequence of alkaleſcent aliment taken in, or obſtruction of thoſe excretions by which alkaleſcent parts are thrown off. With regard to putrid Fevers, there is much darkneſs and obſcurity. In the caſe of Scurvy, we can ſuppoſe the diſeaſe to take place without a ferment; whereas in the latter caſe that muſt be taken in; and, indeed, a ferment of a powerful nature, and rapid progreſs. As to its manner of operation, it is doubtful whether it acts wholly on the fluids, or chiefly on the ſolids. That it does act on the ſolids often, is evident from the nervous affections accompanying it, and from the cure, we doing much more by Antiſpaſmodics than Antiſeptics. I have no doubt of the action of contagion being on the nervous ſyſtem, though at the ſame time I will not deny their action on the fluids. I have ſeen inſtances of it. A ſervant, in a family where I was employed, who lived very much upon vegetables, and was without any obſtructed ſecretions, on a ſudden was ſeized with a flaccidity of the gums, violent incoercible hæmorrhage and *petechiæ*, and a putrid Fever, ſoon ending with death. Here, certainly, the operation was on the fluids; and many inſtances of the ſame kind occur in the annals

annals of Phyſic; but wherever this action on the fluids occurs, a cure is very little in our power. A chronic alkaleſcency in the blood-veſſels is only to be cured by throwing in a large quantity of vegetable aceſcents, and by opening the excretions, promoting perſpiration and urine. It is not to be cured by any ſubſtances not converted into our fluids, however powerful Antiſeptics, or effectual neutralizers of Alkali, becauſe it is neceſſary the vitiated fluids ſhould be entirely ſupplied with new ones. Practice confirms this; and I mention it to prove what I ſo frequently inculcate, that art has little power of altering our fluids. As Alkaleſcency may occur in the *primæ viæ*, it is to be corrected by Acids. Theſe are of two kinds, native and artificial. In treating their virtues, we ſhall firſt ſpeak of Acids in general, and then of particular Acids.

ACIDS in GENERAL.

Applied to the lips, they ſhew an aſtringent quality, as appears by vinegar expelling from them the red blood. This aſtringency is only proper to be taken notice of when they are conſiderably diluted. Hence the vegetable Acid is commonly uſed, and where this part of their operation is required; and hence they are uſed to bathe over-ſtretched ligaments. In a more concentrated ſtate, to this aſtringent they join a ſtimulant and rubifacient power, and therefore we have thought of applying them in paralytic caſes; for which purpoſe we blend them with oily matters, as hogs lard, in the *Unguentum paralyticum*, to obviate an exceſs of their inflammatory property. A more fluid oil than the former may be employed, with the advantage, perhaps, of more accurate mixture. This ointment is certainly ſerviceable, though not with great advantages. If the Acid be blended with too great proportion of oil, the ſtimulus is not conſiderable; if not, it is inflammatory, and does not extend over the ſyſtem. It ought only to be employed where benefit is expected from a few applications of it; for on repeated uſe, inſtead of increaſing, you will eaſily ſee it muſt impair and deſtroy the ſenſation

ſation of the nerves *. Applied alone in a concentrated ſtate, Acids prove corroſive, and deſtroy the texture of animal ſubſtances. This corroſive quality is not only taken off by an union with metals, but encreaſed by it. Thus, in the lunar cauſtic, ſomewhat of its effects are to be attributed to the acid. The ſame is the caſe with the Butter of Antimony, to which, as well as to the Acids, as cauſtics, may be objected the inconveniences of fluidity. How much Acid can perform alone, may be ſeen in the Medical Eſſays. It has there been propoſed to make an alternate application of acid and cauſtic Alkali, giving the one, when the other had begun to pain; but in this method, each would hinder the other's operation, and a cruſt of neutral ſalt would be formed, which would deſtroy the effect of the Cauſtic. In ſhort, the whole affair ſeems to be a mere whimſy of refinement.

With regard to the internal uſe of Acids. In the mouth they exert *aſtringent* effects. To obtain this property, they have been exhibited in various forms. It was Sydenham's practice in the Angina to give the Vitriolic Acid with *Mel roſarum*. Where laxity prevails this may be uſeful, but it is difficult to diſtinguiſh ſuch caſes; and in more violent inflammation they are certainly hurtful and dangerous, by their ſtimulant, and, perhaps alſo, their aſtringent power. Acids alſo exert their *ſtimulus* in the mouth, and encreaſe the excretion of ſaliva and mucus, and hence allay thirſt, in which intention they are ſometimes given in Dropſies, where we want that effect without encreaſing the quantity of fluids. It has been ſaid, that they diſſolve the mucus, but this is not properly proved. On experiment, they do not coagulate it like blood, but rather have a tendency that way, *viz.* either concreted into cruſts, or in the caſe of *Aphthæ*. In any ſort of Cough,

* This remedy is equivocal, becauſe as much is loſt by the ſedative as gained by the ſtimulant power, and to be avoided; applied externally to the noſe, acids have been uſed in hyſteric fits and faintings; as the nitrous and muriatic acids are deleterious, the vegetable only can be uſed in this intention; the vitriolic has no odour; the vegetable acid from regenerated tartar is moſt penetrating.

where

where a load of mucus is accumulated in the mouth, they may be uſed. Alum and Acids have been employed to cure *Aphthæ*, but the practice is doubtful. They will, indeed, take away the *Aphthæ*, but then they are very apt to return worſe than before, except in ſome particular caſes, which are difficult to diſtinguiſh. Borax anſwers much better, eſpecially in children.

Carried into the ſtomach, Acids prove a grateful ſtimulus to it, and promote appetite, which ſhows they are not unfamiliar to the ſyſtem. The acid *reliquiæ* in the ſtomach are ſuppoſed to be the cauſe of appetite, but this is more connected with the ſtate of the ſyſtem in general. Acids, by checking putrefaction, ſerve to preſerve at leaſt, if not to excite, appetite; but not only do they obviate the putrefactive, but alſo check the vinous and acetous fermentations; whence they are uſed to prevent flatulencies, *&c.* the conſequence of theſe. At firſt I thought this difficult to account for, but I now ſee that it is not acid but aceſcency which is the diſeaſe; that vinegar, which has already undergone the acetous fermentation, is not near ſo hurtful as vegetable aceſcents, and mineral acids ſtill leſs ſo. Thus lemon, having its aſtringency improved by roaſting, I have ſeen cure Spaſms ariſing from aceſcency; and thus the chlorotic girl eats the ſour green fruit with ſafety, while the ripe encreaſe her diſorder; and hence the magiſtrate in wine countries does not ſuffer the grapes to be gathered till they are fully ripe, leſt the wine ſhould not be well fermented. In the ſtomach, too, Acids quench thirſt, by promoting a flow of liquors to it, by preventing putrefaction, and perhaps, too, as refrigerant. This property which Acids poſſeſs, of being cooling and ſedative to the whole ſyſtem, ſeems contradictory to the ſtimulus we aſcribed to them; but as Acids in certain doſes and dilution are aſtringent, and as Aſtringents are ſedative, the effect is more eaſily underſtood. Whether their action be not analogous to that of cold water, I ſhall not determine. They may be diuretic and diaphoretic, by being carried to the ſecretory organs; but it is certain alſo, they exert this property before they arrive there.

In the Inteſtines. When Acids arrive there unaltered, they may be detergent by promoting the excretion of mucus. As checking putrefaction, as ſedative, checking the periſtaltic motion, and alſo as aſtringent, Acids are uſeful in Dyſentery, but chiefly as altering the bile, to a change of which, Dyſentery ſeems owing. It is the Aceſcents in this diſeaſe which we prefer to the Acids, perhaps from ſedative powers analogous to neutrals. The foſſile Acids have not the ſame effect with the others, not proving much purgative. Their action in the inteſtines ought to be enquired into, as they precipitate the bile.

Whether in their progreſs through the lacteals they can act as acid, or in the maſs of blood, is extremely doubtful, from the dilution they muſt neceſſarily undergo before they reach theſe ſyſtems. They might be ſuppoſed to cure, at leaſt to check the Scurvy, but neither the one nor the other is obſerved, ſo that their effects on the maſs of blood are very doubtful. They have been recommended in Hæmorrhagy. Here it is ſuppoſed they act on the open veſſels, and by coagulating the fluids; but we cannot imagine them to be carried thither, and we muſt rather ſuppoſe they have their effect in the *primæ viæ*, and not materially, but by conſent on the veſſels.

Though their effect on the blood be denied, yet it has been conſtantly allowed they may be collected in the excretories. Like other ſaline matters they may go along with the ſeroſity, paſs by the kidneys, and prove diuretic. On this foundation alſo they might be diaphoretic and ſudorific, but from their manner of action theſe properties ſeem to be in conſequence of their effects in the *primæ viæ*.

Acids are ſaid to irritate the *Bronchiæ*, and promote a Cough, which gives us a caution to their uſe in Hæmoptoë, and other caſes where they are employed. Muriatic acid inflames iſſues.

PAR-

PARTICULAR ACIDS

We divided into native and artificial. The native Acids in general have the effects we mentioned of Acids, as exerting in the *primæ viæ*, but beyond that they ſcarcely act as acid; but by the action of the ſyſtem are liable to be converted in *ſuccum et ſanguinem*, and hence are adapted to the cure of the Scurvy, and it is there we frequently employ them. They differ as more or leſs mild or acerb.

Of the artificial Acids the firſt mentioned is Wine, the Acid of which approaches to the laſt, as more or leſs convertible into the animal fluids. The others are more a-kin, and more invincible to the ſyſtem, if we except the vegetable, which is divided into the fermented and diſtilled, which laſt is leſs convertible than the former. Such diſtilled Acid appears in Tar-water, whoſe action ſeems only to be in ſo far as it is acid. It might, indeed, owe much of its virtue to the oil; but practice does not confirm this. Tar-water may be uſeful in promoting the whole fluid ſecretions, and in ſome caſes antiſeptic; and if you look into what has been writ upon it, you will underſtand its real virtues from what has been already ſaid.

The foſſile Acids are ſtronger. Muriatic Acid has at all times been famous as promoting appetite, and aſſiſting digeſtion. I have not given it pure, but joined with ſome alkali. This Hoffman tells us is the *Tinctura aperitiva Mœbii*, only reddened by the addition of ſome roſes.

Vitriolic Acid is employed for moſt of the purpoſes of Acids obviating fermentation, &c. This is ſuppoſed ſuperior in hæmorrhagic caſes, but I cannot perceive this. It may perhaps retain ſomewhat of the virtues of concentrated acid; though I will not maintain that.

The nitrous Acidis commonly excluded entirely, out of prejudice, for if equally dilute, it is as ſafe as any of them. It is not, however, totally diſuſed. Boerhaave employed it in his *Nitrum nitratum*, which is a nitrous ammoniac, only with a ſuperabundant quantity of acid.

Sedative Salt by Homberg was recommended as of extraordinary power, but in no inſtance has that been diſcovered fairly. In one or two inſtances, I thought it had given relief in the Chincough, but I found afterwards its effects muſt be attributed to other medicines joined with it. Any virtue it has, is that of being gently and weakly ſedative, but even this is not well eſtabliſhed. The French now acknowledge all this.

Acid of Amber has been frequently uſed in medicine, though it be not ſo long ſince we diſcovered it to be an Acid. It has failed me in every trial. If any advantage be found from it, it is owing to the oil joined to our *Sal Succini*, for no body has yet uſed it pure, and indeed it is very difficult to get it ſo.

GENERAL TITLES.

The *Nutrientia* are the only proper Antalkalines which can be uſed in the Scurvy. Putrefaction is promoted by any thing weakening the ſolids, and therefore Aſtringents are found uſeful in Scurvy, eſpecially the *Vaginales* referred to, which are both acid and aſtringent. How far Demulcents can be employed to cover alkaline acrimony, I will not ſay, but the *Dulcia* are of an acid nature, and may act from that quality.

ACIDS employed in MEDICINE.

- Ol. Vitrioli.
- Spt. Vitr. fortis.
- — — tenuis.
- Ros Vitrioli.
- El. Vitr. acidum.
- Ol. & Spt. Sulph. per campanam.
- Elix. Vitr. dulce.
- Spt. Vitriol. Volatilis.
- Aqua Sulphurata.
- Gas Sulphuris.
- Clyſſus Antimonii.

- Spt. Nitri dulcis.
- Nitrum nitratum Boerh.

- Spt. Salis communis.
- — — dulcis.
- Spt. Vitrioli philoſophicus.
- Tinctura aperitiva Mœbii.

- Succi acidi nativi.
- Gelatina Ribeſiorum, &c.
- Miva Cydoniorum.
- Syrupus Limonum.
- Rob Limonum.
- Acetum Vini.
- Nitrum Coralliatum.
- Acetum diſtillatum.
- Spt. Æruginis, vel Veneris.
- Cryſtalli Tartari.
- Acidum Abietis, &c.
- Aqua Picea, ſive Tar-water.
- Spt. Mellis.
- — Panis.
- Sal Sedativum.
- Sal Succini.
- Spt. Formicarum.

ANTISEPTICA.

By theſe, I mean ſuch medicines as obviate the ſeveral tendencies of the ſyſtem towards acrimony. I would have rather choſen the term Antifermentative, as what are included under the title of Antiſeptics, obviate the vinous and acetous, as well as putrefactive proceſſes. The Antiſeptics, ſtrictly ſo called, deſerve our chief conſideration in medicine. The hiſtory of putrefaction, in every part of it, is abſolutely neceſſary for underſtanding the animal œconomy, and when I inſerted this title, I intended to have ſtudied it myſelf, and to have delivered it to you; but the want of time has prevented the execution of that intention. I muſt be content with referring you to almoſt the only writer on that ſubject. There is, indeed, ſomething in Boerhaave, and in a paper by Cox, in the Philoſophical Tranſactions; but their faults are corrected by Pringle. If this liſt had been made up thirty years ago, it would have

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ſtood very different from what it is at preſent, and many of the ſubſtances ſet down here would have been reckoned as Septics. The liſt in our Catalogue is chiefly taken from Dr. Pringle, with ſome additions from analogy, and my own experience.

Dr. Pringle certainly deſerves much praiſe for what he has executed on this ſubject; but ſtill what he has ſaid requires confirmation and addition, and no experiments are abſolutely to be reſted upon, till they are repeated with different views, and by different hands. Somewhat of a more correct Chemiſtry is neceſſary. Thus we cannot truſt his experiments with common Salt, becauſe a pure ſalt was not employed. This he alſo, according to the old opinion, ſuppoſes to have an abſorbent earth for its baſis, and the ſame miſtakes occur in other ſubſtances. Beſides, he does not operate on the beſt of ſubjects, and animal blood is what we ſhould wiſh our experiments to be chiefly performed upon. Hence the whole of this doctrine, as applied to the purpoſes of medicine, ſhould be received with caution. I would not, however, doubt Dr. Pringle's concluſion.

Two queſtions I would propoſe, *viz.* Whether putrefaction is ſo common a cauſe of diſeaſe, as is imagined? And, Whether antiſeptic ſubſtances can be introduced in ſuch manner into the human body, as to exert that antiſeptic quality in the common maſs of blood?

EVACUANTS in GENERAL.

A doubt ariſes with regard to the propriety of placing theſe among the medicines which act upon the fluids. They act, probably, on the ſolids, but have the fluids for their object. With regard to their operation, there have been ſeveral opinions. 1. It has been ſuppoſed they act in the maſs of blood, as, by rendering the blood of a fluid conſiſtence, they promote the fluid ſecretions; but this method extends ſo much in common to all the ſecretions, as not to explain how particular ones are promoted; for it will ſtill

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be a doubt how we can give the fluidity proper to particular ſecretions. 2. To obviate this, it has been ſaid, that all the ſecreted liquors exiſt formally in the maſs of blood, and that the ſecretory organ only ſeparates them; and with regard to the Evacuants, it has been ſuppoſed that they have an elective attraction to particular portions of our fluids. But all this is a mere ſuppoſition. There is no proof of the formal exiſtence of theſe matters, and of their not being altered in the ſecretory organ. Neither of theſe are ſatisfactory, and hence we muſt have recourſe to this third ſuppoſition, that Evacuants, particularly Stimulants, ſtimulate their reſpective excretories, as can be proved in the caſe of Errhines and Sialagogues. It is difficult to apply this to Evacuants in the maſs of blood. We muſt ſuppoſe them ſomehow determined to paſs by particular excretories, in conſequence of being joined to particular parts of the blood more copiouſly paſſing there, and thus ſtimulating thoſe very ſenſible and irritable organs. Still a queſtion remains, Whether evacuants may not have a ſpecific power in ſtimulating one excretory more than another? This is difficult to determine. I muſt obſerve, that Evacuants are general Stimulants. Thoſe which affect the noſe, carried into the ſtomach, will prove emetic; into the blood, diuretic, diaphoretic, and pectoral. The Stimulus is not in any that I know of certainly ſpecific, and a common power is evident in moſt of them. This queſtion will be more fully mentioned under Particulars.

With regard to particular Evacuants, I have inſerted them at random. I have begun *a capite ad calcem*, and therefore the firſt on which our enquiries will be beſtowed, is the following head of Errhines.

ERRHINA.

Errhines are medicines applied to the inner membrane of the noſe, producing a diſcharge of mucus, accompanied with a ſtimulus, and commonly ſternutatory. With regard to their effects in medicine, in the firſt place it is a general rule, that diſeaſes to be cured

cured by Evacuants, are more effectually cured by theſe being applied to the part affected. There are, indeed, caſes where the evacuation muſt be great, and ſuch direct application cannot be made, and in ſuch caſes where we intend to alter the diſtribution of the fluids in the ſyſtem; but theſe are the only exceptions. Upon this is the foundation of the virtue of Errhines. They are adapted to diſeaſes of the head, acting partly by the ſneezing, that general convulſive motion they produce, and partly by evacuation. Since obſervations have been accurate, Errhines have not been much uſed; and where they are uſeful, is difficult to determine. They are certainly proper in rheumatic affections in the head, in which evacuations of any kind are neceſſary. I have known inſtances of not only temporary relief procured from them in ſuch caſes, but even the rheumatic diatheſis being removed. I have known perſons, unaccuſtomed to Tobacco, on the firſt beginning to ſnuff, relieved, and even cured of the tooth-ach, and other rheumatic affections, to which they were ſubject. In all rheumatic head-achs, they are uſeful; and, analogous to theſe rheumatic affections, in all neighbouring inflammations of the chronic kind, as inflammations of the eyes frequently are. I ſee practitioners cautioning againſt Errhines, as producing congeſtions in the veſſels of the head. If the diſeaſe be recent, certainly we ought not to uſe them; but when it has continued for ſome time, I have ſeen a cure from Errhines. Many diſeaſes are of this inflammatory nature, which we do not imagine to be ſo, as the opacity of the Cornea, which is frequently founded in inflammation, though there be no ſeeming redneſs, and alſo in a beginning cataract. In theſe, Errhines of the ſtrongeſt kind may be uſed. At different times, Errhines have been employed in all diſeaſes of the head, though with what ſafety or limitation I cannot ſay.

Theſe are the general virtues of Errhines. The virtues of particular ones cannot well be fixed. I believe our liſt might have been more general, as there is no ſuſpicion of a ſpecific virtue. Many poſſibly are omitted, mentioned by both *Materia Medica* writers

writers and Phyſicians, as the *Lilium convallium*, Benzoin and its flowers, to which *Sal Succini*, an analogous ſubſtance, might be added, and the *Vitriolum album*. Thoſe mentioned in our Catalogue are divided into two claſſes, the Vegetable and Foſſile, and I propoſed alſo a diviſion into the *Mitiora* and *Acriora*. I have endeavoured to range them in the order of their power. The juices of the Beet being ſweet, are ſternutatory, in conſequence of the ſugar they contain, which itſelf is an Errhine. Among the *Acriora*, Euphorbium ſhould have been placed lower. Among the Errhines none is more famous than *Turpeth mineral*. In diſeaſes of the eyes it has been much commended in general; but it muſt be obſerved, that this and other Acrids are not only apt to produce violent Inflammation and dangerous Hæmorrhage in the membrane of the noſe itſelf, but alſo in the neighbouring parts. I have ſeen a few drops of the *Iris noſtras*, or *Iris paluſtris lutea*, occaſion a violent ſneezing and diſcharge of mucus with blood, ſwelling of the whole head and neck, and, perhaps from ſome neglect of the patient in keeping himſelf warm, indurations of the cheeks, *&c.* only yielding to repeated bleedings, but curing, however, the patient of the tooth-ach, and diſeaſe for which it was applied. Even where it was given in a ſlighter doſe, often a great rheumatic affection was caught during the uſe of it. I mention all this, to give a caution that cold got during the uſe of theſe remedies is often worſe than the diſeaſe they were intended to cure.

The only two I have known employed with ſafety and advantage, are Tobacco and Aſarum. The firſt is only uſeful when we begin the practice. Aſarum is recommended as keeping up a longer flow of mucus than any other. Thoſe who favour it, ſay it is neceſſary it ſhould produce a mucus with ſtreaks of blood. Given at the interval of two days between each doſe it has cured a violent chronic inflammation of the eyes.

SIALAGOGA.

Theſe are common Stimulants, and often the ſame as the Errhines. They are divided into two kinds, the Vegetable and Foſſil.

The Vegetable are only ſialagogue as externally applied, and their effects may be underſtood from what we have ſaid of Errhines.

The Foſſil act in conſequence of being introduced into the maſs of blood. Of the *Hydrargyrus* we muſt take a particular notice.

*MERCURY.

Upon this head we ſhall firſt conſider the operation of Mercury in general; and here the firſt queſtion that occurs, is, whether it operates on the fluids or ſolids; as diſſolving the former, or as a ſtimulant to the latter, exciting the reſpective ſecretions of thoſe to which it is applied?

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* The following account of Mercury is added from the Author's works on Chemiſtry, and though not ſo compleat as might be wiſhed, may ſerve to explain the ſubject more fully.

This is a ſubject that has been of all the moſt laboured in Chemiſtry, and moſt frequently employed in Medicine.

I ſhall here endeavour to ſhew its variety of preparations, and eſtabliſh their relation in regard to each.

1. The firſt queſtion that ariſes is, Whether Mercury is active in its crude ſtate, as it is not (in that) acted on by the vegetable acid? This, however, is ſomewhat doubted; but ſome ſpeak much of its efficacy, and Dover gave it in a variety of diſeaſes; and when this is the caſe, a medicine will frequently reap that honour which is only due to nature. It certainly may be converted into an active ſtate, by a ſmall degree of trituration. Nay, even the agitation of the ſteadieſt buildings, when ſtanding in a phial, will induce a black powder on its ſurface, and, probably, the agitation in the ſtomach may anſwer the ſame intention.

2. It is rendered active by being turned into vapour, and is then indued with a ſedative power, and can induce palſies of various kinds; hence Gilders are particularly ſubject to it. *Vide* De Haen. When uſed in venereal caſes, it brings on a ſalivation. Why ſhould its effects in theſe two caſes be ſo different? But this action, in a ſtate of fume, is not peculiar to Mercury, but common to other metals in ſome degree; but its operation can never be conducted with accuracy.

3. It

The firſt is the common ſuppoſition. That opinion, in the firſt place, has been ſupported by arguments *à priori*. 1. It has been ſaid, that it acts from its ſpecific gravity, its great momentum in the maſs of blood breaking down its texture. But to me this

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3. It is rendered active when calcined, whether by itſelf, or with gold. It is by this means, probably, only more capable of being acted on by the vegetable acid, and conſequently by the acid in the ſtomach.

4. It is peculiar to Mercury to be rendered active by trituration. It can be thus converted into a black powder, manifeſtly active to the human body. This trituration goes on ſlowly in glaſs veſſels when *per ſe*, but may be expeded by the addition of rough bodies, or even of fluids; and when a ſmall portion is thus converted into a black powder, it gives the whole that appearance; however, upon waſhing it, it will eaſily ſeparate from the crude.

Keyſer, a celebrated empiric in France, has found a way of converting it into this ſtate more effectually, by triturating it with water, which waſhes out the powder as it forms, and hence ariſes its peculiar efficacy. In this ſtate it is ſoluble in the vegetable acid, for which reaſon he adds a quantity of that acid, which aſſiſts in ſeparating the pure powder.

Other ſubſtances have been uſed to aſſiſt the trituration. Honey is much preferable to either the balſams, or gums, of which laſt I have ſeen pills made of ſo ſtiff a conſiſtence, as to paſs through the body undiſſolved, and unaltered.

This objection is applicable to gum ammoniac likewiſe, unleſs at the ſame time an equal quantity of ſoap is added, which gives it conſiſtence and ſolubility.

They have alſo given it with reſin of guiacum, but this is ſtill worſe than the foregoing, as being more difficultly triturated, and leſs ſoluble.

In making the trituration we are very apt to be deceived, by thinking it ſufficient when no globules appear to the microſcope, for after an intermiſſion of the triture, globules will appear that did not before; we ſhould return to it at intervals, and continue it till it is almoſt ſoluble in water.

From this difference of triture, very different effects will ariſe in the ſame medicine. I have thus ſeen ſeven grains produce the ſame effect with ʒiij. of a worſe prepared medicine. Oils of any kind likewiſe, as ſuet, &c. may be joined, when we uſe it externally. Some of the Balſams would extinguiſh it better, as Balſ. Terebinth. Liquid Storax, or Balſ. of Sulphur, but their eroſion of the ſkin renders them uſeleſs.

Here the ſame cautions are neceſſary, with regard to triture, and the efficacy of the ointment will be proportionable.

is not at all ſatisfying; for, firſt, it is proved by Chemiſtry, that mechanical force never divides Mixts, but only Aggregates. Our veſſels, indeed, whoſe action may be ſuppoſed mechanical, ſeem to have ſome ſuch power; but then this is from

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It is likewiſe triturated with teſtaceous and dry powders, and thus forms the *Merc. alcalizatus.* It is thus rendered capable of being active, but as its action depends on the acid of the ſtomach, and as the teſtaceous powders would deſtroy that acidity, its power of acting would be thus deſtroyed.

Sugar anſwers better, eſpecially if we add a drop or two of eſſential oil to aſſiſt its diviſion.

Triturated with ſulphur it becomes an inert ſubſtance, as being capable of reſiſting the vegetable acid.

This I could determine *à priori*, whether it was in the form of Æthiops Mineral, or native, or factitious Cinnabar. Some ſay theſe are active, but I never could find them to have any effect. I have ſeen the Æthiops Mineral given in as large quantities as the ſtomach could bear, when the Sulphur only exerted its laxative effects.

Mercury may be united with ſulphur in three ways; firſt, by trituration; ſecondly, by fuſion; thirdly, by ſublimation; of which the laſt is the worſt, becauſe the cloſer the connection the leſs active.

5. We are now come to its ſaline ſtate. There are ſome of its combinations with ſaline ſubſtances that are not ſoluble in water. This, perhaps, may be thought an objection to the term, but we ſhall wave this, and call every combination with acids ſaline. Here the alkalies are entirely out of the queſtion, as it entirely rejects any union with them, and as the leaſt of their preſence entirely deſtroys the gilding proceſs; the ſame, too, with regard to neutrals.

Its union with the Foſſil Acids has always been known, and to theſe I have added the Vegetable. I ſhall ſpeak of it as combined with theſe in its crude, calcined, or triturated ſtate.

The calcination and trituration of Mercury is a curious problem, and what other metals are not ſubject to.

In trituration, Are the particles that conſtituted its crude nature ſeparated? Or does it admit of any addition under it? I ſhould be rather of the latter opinion; but what this addition is, whether of ſome matter univerſally diffuſed, I know not. We may next conſider it, as it is diverſified by the acids.

Turpeth Mineral may be made in two ways; firſt, by adding the Mercury to the Vitriolic Acid, when at the boiling heat, and thus obtaining a matter that has the appearance of a white calx, which, on being waſhed in pure water, is converted into a yellow powder.

This

encreaſing the coheſion, but not altering the mixture. 2. Suppoſing ſuch effect could take place from mere mechanical force, that here is not ſufficient; for any body reduced to ſo great tenuity as to ſwim in a fluid, will have, in proportion to its greater tenuity, the ratio of its

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This change of colour is a curious problem. Secondly, it may be made by diſſolving the Mercury in the Nitrous Acid, and then adding the Vitriolic, and then by waſhing it we get the Turpeth.

This is the moſt eaſy proceſs, but it is the moſt acrid preparation, becauſe there is a quantity of the Acid adhering, but by repeated affuſions, with the aſſiſtance of heat, it may be made nearly the ſame.

Mercury is next combined with the Nitrous Acid. Theſe preparations have been but little employed in medicine, and have rather been uſed as the foundations of others.

It is likewiſe combined with the Muriatic Acid, and this either by precipitation or calcination, and accordingly forms either the Mercurius ſublimatus corroſivus, or the Mercurius precipitatus albus of Boerhaave.

The Marine Acid does not unite with it in a fluid form, and muſt therefore be uſed either as combined with metals, or with neutral ſalts; for this purpoſe common ſalt is added to Mercury diſſolved in the Nitrous Acid.

A certain rule to judge of its acrimony, is from its ſolubility in water, for the greater quantity the water will take up, the more ſalt adheres to it, and conſequently the more acrid is the preparation.

The method of precipitation from the menſtruum, when it is in the form of a Calx Mercurii, is much eaſier; but there is an objection, that the Acid is in too great quantity, and the preparation is not eaſily brought into a cryſtalline form. We have found a way, however, of managing this, by ſuſpending it in *Nitrous Ammoniac*, and then adding common ſalt. All the other preparations of Mercury depend on their being rendered more mild, or more acrid.

They are rendered milder, firſt, by the abſtraction of the Acid; or, ſecondly, by the addition of Mercury.

1. By the abſtraction of the Acid. Some have doubted if Mercury is rendered more powerful, by being added to Acids; but I think none who are converſant in practice can deny it. The degree of trituration certainly varies its efficacy, but one-eighth of a grain of corroſive Mercury is a doſe.

One method of abſtracting the Acid is by calcination, as in the Red Precipitate. The foreign Precipitates are thought to be better than thoſe made at home. The London College has, therefore, given particular directions, nay, more than neceſſary, as I think; for the whole difference between the foreign and domeſtic ſeems to depend on the degree of calcination, which is ſometimes carried too far, ſo as to ſublime too much of the Acid.

Another

ſuperficies to the quantity of matter ſo increaſed, as not to be able to overcome the reſiſtance. Thus the moſt ponderous gold can be ſo minutely divided as not to be able to overcome the coheſion of water or ſpirit of wine, but to be ſuſpended in them; ſo that much leſs can

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Another method is by attraction of the Acid. This is of two kinds, firſt, when the acid is attracted only; and, ſecondly, where the Mercury is precipitated. An inſtance of the firſt is the *Pulvis Principis*. *Vide* Lewis. The water here diſſolves that part which has the largeſt proportion of acid, and leaves the leſs ſoluble, and conſequently leſs acrid behind. Water applied to any of the ſaline Calces will thus abſtract the more active part.

Ardent Spirit, in many inſtances, abſtracts the Acid from metallic ſubſtances pretty entirely. I think I have ſeen Corroſive Sublimate rendered inactive by this means. It may likewiſe, when dilute, act like the water, in abſtracting the moſt acrid part. This is the foundation of the *Mercurius Corallinus* and *Panacea Mercurii*.

Camphor unites with Acids in the largeſt quantity of any other ſubſtance. It triturates eaſily with, and has been added to the Turpeth Mineral, (*Vide Edin. Med. Eſſays*;) and I have often uſed it with ſucceſs before our late improvements.

Mercury is rendered milder by attraction and precipitation. The *Mercur. precip. Fuſcus Wortzii* is Mercury diſſolved in the Nitrous Acid, and precipitated by a fixed alkaline Salt; this gave a mild preparation, but its unſeemly colour was the chief objection. To obviate this the Muriatic Acid was uſed, which gives us the *Merc. precipitatus dulcis* of the former Edinburgh Diſpenſatory; but it has been but little uſed in our ſhops, though it might be an uſeful medicine, and anſwer pretty nigh the ſame intentions with Calomel.

The Muriatic Acid has been uſed in conjunction with Copper, ſo that the Mercury was precipitated in a green powder. Different accounts have been given of this, ſome approving, others diſapproving of it; but it ſeems to act uncertainly, and with violence. I ſhould think that from this combination of copper we might receive advantages in external applications.

The *Mercur. precipit. albus* of the London Diſpenſatory is made both with fixed and volatile Alkali; the colour depends on the proportion of the volatile Alkali.

Another way by which mercurial preparations are render milder, is by a freſh quantity of Mercury. This is effected in the proceſs for Calomel, where a freſh quantity of Mercury is added to a portion of Corroſive Sublimate. The union of theſe is firſt made by trituration, and it then is more intimately effected by repeated ſublimations.

Sublimation to the ſecond or third time may produce the intention, but to carry it farther will only ſeparate the Mercury.

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Mercury be ſuppoſed to alter the coheſion of our blood. 3. Suppoſing the force of Mercury capable to break down our blood, the quantity, even the greateſt we can ſuppoſe to be introduced, will not have the effect, ſo that every thing ſaid on the mechanical action of Mercury on the Fluids is without foundation.

The only true ſtandard of a ſufficient ſublimation is to examine its ſpecific gravity in ardent ſpirits, and ſo determine their comparative mildneſs. Two ſublimations, after a ſufficient previous triture, generally are ſufficient.

The metal may have the acid adhering to it in any proportion, but the acid ſeems to have a point of ſaturation with regard to the metal, and when this proportion is ſuited, neither water nor alcohol will have any effect on it. But thus endeavouring to render the corroſive mild, we bring it to a Mercurius dulcis, and this equally well, either by abſtracting the Acid, or by adding Mercury.

MERCURIAL PREPARATIONS *rendered acrid, or kept ſo.*

Theſe are rendered more acrid by rediſſolving the Precipitates. When Mercury is precipitated from any of the foſſil acids by alkalis, it is ſoluble in the vegetable acid. I have precipitated Mercury from the nitrous acid, by means of fixed alkalies, and again diſſolved it in the muriatic, and from thence obtained it in cryſtals. This is a pretty accurate preparation; one grain of this I diſſolved in an ounce of water, and gave twenty drops of it for a doſe, ſo that ſuppoſing this grain contained one third of Mercury, which ſeems to be the caſe, this one third diſſolved in an ounce of water, or four hundred and eighty drops, theſe twenty drops could only contain $\frac{20}{480}$ of one-third of a grain of Mercury. This ſhews the great addition of power that Mercury acquires by being joined to Acids. This is the *Mercurius ſolutus*, as I have called it.

By Suſpenſion with SAL AMMONIAC.

I uſed formerly to ſay, that the combination with the muriatic Acid was more corroſive than that with the nitrous or vitriolic, but I have found the nitrous equal to either of the others; but when diſſolved in water or alcohol, a portion of the acid is abſtracted, ſo that the Mercury falls to the bottom in form of a powder; hence aroſe the difference of its efficacy, and the dangerous inaccuracy attending it; for whether diſſolved in water or brandy, the ſtrength of the ſolution will be widely different at different times, and every day freſh Mercury will be ſubſiding. For theſe reaſons it was that I firſt thought of the preparation juſt mentioned. Sal Ammoniac renders the metallic Salt more capable of being taken in greater proportions, as it increaſes the ſuſpenſibility of water to twenty times its natural power. The Sal Ammoniac not only enables us to give it in a ſmaller doſe, but by continually ſuſpending the Mercury it renders that doſe always accurate. All theſe preparations differ only in being mild or acrid.

Of

Secondly. Thoſe who alledge that Mercury acts on the Fluids, alledge it acts by a ſeptic power. The proofs brought are, the remarkable fætor of the ſaliva, the tumid flaccid gums, and the blood ready to flow out from them. Theſe arguments ſeem very ſpecious. Again, ſay they, experience ſhews that Mercury is hurtful in the Scurvy. With reſpect to its effects in the Scurvy, that may depend on its irritation and ſtimulus, and all other ſtimulants have the ſame effect in aggravating Scurvy. As to the fætor of

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Of the Action of MERCURY.

I imagine that Mercury acts only as a ſtimulus on the ſenſible and irritable parts of the ſolids. It has been long thought to have acted on the fluids by diſſolving them; but ſuppoſing it ſhould do ſo, there are undoubted proofs, too, of its acting on the ſolids. Thus it acts as an emetic and purgative, as a ſtimulant to the whole vaſcular ſyſtem, as a diaphoretic and diuretic. Had it acted on the fluids only, every ſecretion would have been increaſed equal with the ſalivary. It never produces any effects on the ſecretions, till it has arrived in form and ſubſtance at the ſecretories. Thus we ſee it produces a ſlight inflammation, and increaſed diſcharge at the ſalivary glands.

In the height of a ſalivation, where the inflammation runs ſo high as to render bleeding neceſſary, an inflammatory cruſt was found upon the blood, a circumſtance very inconſiſtent with the ſuppoſed diſſolution.

We ſhall, however, advance, on the other hand, the moſt favourable fact, in ſupport of its acting on the fluids. It is found greatly to aggravate the ſcurvy, where the blood is found to be alkaleſcent, and diſpoſed to fluidity; and that the firſt ſymptoms of a ſcurvy are ſimilar to thoſe of an incipient ſalivation, *i. e.* a putrid laxity of the gums, tendency to bleed on the ſlighteſt injuries, and a fetid breath. So far I allow. But I imagine it has only theſe effects when accumulated in large quantities in the ſalivary glands, and that it does not produce the ſame effects in other parts of the body. By this particular accumulation in the ſalivary glands, it ſtimulates them, and cauſes a greater flow through their organs, but does not, by inducing a diſſolution, occaſion the blood to diſcharge itſelf by this outlet. The acrid preparations ſtimulate the ſtomach, and, in conſequence of that, perhaps the whole ſyſtem by conſent.

The mild preparations never anſwer but when they run off by the ſaliva. This accounts for the ſuppoſition, that ſalivation was the only true application of it. If Mercury had acted on the venereal poiſon as an antidote, it might have been expected to have performed the cure without any ſenſible evacuations. Salivation was thought to be the only way of effecting it, but we now know that it may be done by other ways, and with leſs trouble. We have inſtances of its being cured by the inteſtinal diſcharge; but this is tedious and doubtful. The cure by urine or ſweat muſt chiefly be promoted by the more acrid preparations. But in ſome people all mercurial prepa-

rations

the ſaliva, poſſibly it may have the power of producing that, but not of extending putrefaction over the ſyſtem. But the fœtor can be produced without Mercury, and there is no inſtance of an increaſed ſecretion being kept up for any length of time, without the ſame ſymptoms occurring. This accounts for the other effects in the mouth, which ariſe evidently from the putrid ſaliva; for no one inſtance is alledged of a ſcorbutic putrefactive taint taking place in any other part of the ſyſtem. There is no alteration in the blood during a ſalivation, and its viſcidity appears then as ſtrong as at any other time. Salivation is attended with an inflammation, and the blood ſhews an inflammatory cruſt, which, indeed, may be ſaid to be a ſymptom of the Scurvy; but then, if we examine it, we find it denſer than it appears in that diſeaſe. Again, after the operation of Mercury is over, no taint appears in the blood, but, on the contrary, the perſon is in better health than before, and gives marks of a firmer ſtate of it.

From what has been ſaid, I would conclude, though not certainly, that Mercury acts neither by its mechanic nor ſeptic powers. We have proved at leaſt that it is not ſeptic in the maſs of blood; but if it be ſo, only as collected in the ſecretories. But though we ſhould allow Mercury in a conſiderable quantity to have ſomewhat of a ſeptic power, yet in the ordinary doſe in which we exhibit it, it can never have that effect. In the caſe of unction, that indeed may be

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rations have a particular tendency to the mouth; here we muſt yield to the natural tendency, and ſuffer the ſalivation to go on; but when it can be done otherwiſe, it is with leſs trouble to the patient, and leſs care and attention to the practitioner.

N. B. There is one preparation of Mercury which I forgot to inſert, viz. a third way of uniting it with the muriatic acid. Sal Ammoniac is triturated with Mercury till the globules diſappear; this is put into a moiſt place, where it ſuffers a deliqueſcence, ſome of the Mercury re-aſſumes its fluid form, the deliqueſcent part is to be poured off, and the reſt triturated with the liquefied Mercury till the whole is diſſolved. This operation is founded on the ſtronger attraction Mercury has to the muriatic Acid than the volatile Alkali has.

denied; but we have many inſtances of one-twentieth part of a grain of ſome preparations of it taken internally having the ſame effect as ſome ounces by unction.

All this will be farther confirmed by the arguments we can bring for the action of Mercury being as a ſtimulant. All its effects may be explained from this ſuppoſition. From its ſtimulus in the ſtomach it proves emetic; and carried into the inteſtines, it is purgative from the ſame quality; into the blood, diuretic and diaphoretic; and, in ſhort, like other evacuants, a very general ſtimulus. Other arguments for its action as a ſtimulant are, that it never acts but in an acrid condition, diſcoverable by its metallic cupreous ſtate in the mouth; that a ſalivation can be excited by its external application to the ſalivary glands; that its effects are always accompanied with ſome degree of fever and inflammation; that its effects in ulcers are plainly derived from its ſtimulant powers producing that degree of inflammation neceſſary to the being of good pus, and that it produces theſe effects much better by external application than internal exhibition. In proportion as theſe proofs of the ſtimulant power of Mercury are convincing, they weaken all others that may be alledged for any other method of action.

This reaſoning is ſomewhat connected with another queſtion, *viz.* Why Mercury is more particularly and naturally determined to go by the ſalivary glands? The fact is certainly true, and more ſo of this than of any other acrid acting by a common ſtimulus. Thoſe who talk of its mechanical power ſay, that the more ponderous parts of the blood keeping the axis of the canal, and the courſe of the blood, from the left ventricle to the head, being more in a ſtrait line than in the deſcending aorta, that therefore the more ponderous and ſolid parts will be determined thither. I would alledge that this hypotheſis is not ſupported by Anatomy; for the aorta ſuffers a curvature before it gives off the carotids, ſo that the heavier moleculæ muſt be reflected into this curvature, and conſequently the

reaſoning

reaſoning muſt be groundleſs which is built on the contrary ſuppoſition. Another ſuppoſition is, that Mercury breaks down the blood to the ſize which fits it for paſſing off by the ſalivary glands; but this is very difficult to ſuppoſe, and entirely hypothetical: Much rather may we ſay, that Mercury goes chiefly to the glands, from a certain attraction to the liquor of the ſalivary glands, in the ſame manner as neutrals, by an alliance to the watery parts of the blood, are concentrated in the kidneys. The nature of the ſaliva and of many other of the ſecreted fluids is not known. I would alledge Fordyce's experiments, that it comes nearer to the mucus than has been imagined. This uncertainty with regard to the ſaliva, prevents my endeavouring to go farther to give the reaſon why Mercury is particularly related to that liquor. Upon the whole, Mercury appears a very univerſal Stimulant, and general Evacuant, being emetic, cathartic, diaphoretic, diuretic, and ſalivatory, and accordingly we find it one of the moſt univerſal aperients and deobſtruents with which we are yet acquainted.

Thus much we have thought proper to ſay with regard to the general operation of Mercury. We ſhall now proceed to talk of the preparations of Mercury, as in theſe the effects are diverſified.

PREPARATIONS of MERCURY.

With regard to the uſe of the preparations in practice, Crude Mercury, and the combination in *Cinnabar* and *Æthiops mineralis*, to which may be added the *Æthiops antimonialis*, in ſo far as it contains Mercury, can only by accident, or indirectly, prove medicines. All the others are not only active but powerful; the only diſtinction, however, ſeeming to be, that of being more or leſs acrid. How to determine their difference in that reſpect is not eaſy. It is commonly ſuppoſed that Mercury, triturated with Turpentine and Honey, is one of the mildeſt preparations, and that every addition, as well that by acid, as the fire, gives additional acrimony. The preparations by triture are very apt to be imperfect, and I maintain they are more

active as longer triture is beſtowed. Hence I ſhould imagine, that if Mercury in this way were properly divided, the preparation might prove equally acrid with the precipitate *per ſe*. As prepared in the ſhops, the ſtrength of this medicine is very imperfect, and uncertain. Generally no other teſt is ſought of the preparation's accuracy, but the blackneſs and diſappearance of the particles. Although they diſappear at preſent, upon ſtanding they very frequently are collected, and re-aſſume their form, and therefore, after having obtained the foregoing teſts, we ſhould let the ointment ſtand for a day, and uſe the aſſiſtance of a glaſs, to ſee if any collected globules can be diſcovered.

Mercury united with the Vegetable Acid, as in Keyſer's *Draſſiæ*, ſhould be one of the mildeſt preparations. The preparations of Mercury with the nitrous Acid are milder than thoſe with the vitriolic, and theſe again leſs acrid than the muriatic preparations.

All theſe differ in their operation as that is extenſive or partial. Taken into the ſtomach, they ſhow their effects by producing ſickneſs and pain, and ſometimes go the length of vomiting. This leaves ſome doubt of the ſpecific ſtimulus of Mercury, which, in oppoſition to Antimony, will often ſooner inflame the ſtomach than prove emetic. Whenever Mercury is to be uſed in that intention, it muſt be given in a large doſe. I do not know whether it is by accident, or deſign, that Turbith Mineral has been here commonly employed. Given in the doſe of half a grain, it acts on the ſyſtem in general; but in a larger doſe, *viz.* gr. viij. it is ſaid to prove emetic. In leſs quantity it excites inſufferable pain, and muſt be given ſo as to operate directly. This Turbith Mineral is found to have effects different from any other of the preparations. Theſe will be known from what we ſhall afterwards ſay on Emetics in general. It is found to reſolve ſwelled teſticles, when Mercury in other forms has failed: It alſo ſalivates longer than many other of its preparations; but this is not peculiar to it.

In

In the inteſtines, the ſtimulus of the mercurial preparations is exerted with greater effect, but ſtill it is confined to the part, and Mercury acting in this manner is carried off without any farther effects on the ſyſtem. Mercurial purgatives are ſeldom employed alone, but in conjunction with other purgative medicines, although I have known ſmall doſes of Calomel employed with advantage. When we purge, we commonly think we are operating on the common ſewer of the ſyſtem; but little advantage is to be found from Mercury employed in this way, as its virtues depend chiefly on its operation on the body in general. As a purgative, the moſt inſoluble preparation of Mercury is the beſt, and therefore Calomel is uſed; but when uſed in this way we are diſappointed if we expect it ſhould exert the other virtues of Mercury.

The great effects of Mercury ſeem to be exerted when it is carried into the maſs of blood, and is united in the excretories. A diffuſible preparation of it is neceſſary for this purpoſe, and advantages ariſe from the different determinations. Mercury ſeems to change the whole maſs of blood: This it does in three ways, by Purging, Sweating, and Salivation.

Purging is one of the ſloweſt means. There may be another way than the common of making Mercury exert this action, *viz.* by introducing it into the blood, and then determining it to the inteſtines. Purging is never excited by any means without ſpaſms of the inteſtines, which, when the operation is continued, are apt to end in durable ſpaſm and inflammation. Theſe are attended with very dangerous conſequences; and neither does the method of purging by unction anſwer much better, (altho' perhaps more effectual,) becauſe it is attended with very great pain. The method of Douglas is, on this account, now neglected. He followed, in this method, Deſſaut. Sweating is the eaſieſt operation of Mercury that I know, but the difficulty here lies in preventing any of the others from taking place.

As

As this of Sweating is ſo diffuſe an operation, Phyſicians have been led to employ Salivation, which, however, is attended with many inconveniencies, as inflammation often to a dangerous degree; and it is the univerſal conſent of Practitioners, that they employ only Salivation becauſe no other means can be uſed. If then means be found of exciting copiouſly, and keeping up a Sweat, it ſhould be univerſally practiſed. We have now learned that the moſt acrid preparations of Mercury are moſt apt to have this effect, becauſe they will more readily produce that encreaſe of circulation, on which the encreaſe of this excretion depends. Here the Acrid muſt be given in ſmaller quantity than will make it run to the ſalivary glands. In a great doſe, indeed, theſe preparations are apt to inflame the ſtomach, and if they go to the ſalivary glands are more troubleſome than others; but where this can be prevented their operation is much more eaſy.

In order to avoid the inconveniencies ariſing from Salivation, raiſed by the acrid preparations, the milder ones ſhould be choſen, and ſlowly introduced, and that by way of unction. One of the inconveniencies of a Salivation is, that when Mercury is going off by the ſalivary glands, there are certain means which drive it to the inteſtines. This muſt be guarded againſt; but in a medicine introduced by the mouth there is more danger of this happening, eſpecially as we intend it ſhould be mild, and conſequently leſs ſoluble; whereas by unction it can be given ſlowly without that effect; and for the method of exhibition, Aſtruc's directions are the beſt. All theſe various preparations vary according to regimen.

I ſhould now proceed to the particular diſeaſes in which Mercury is uſeful; but as its action is never ſpecific, and only as an evacuant in general, I ſhall decline this at preſent. It is certainly one of the moſt univerſal Deobſtruents and Aperients yet known. Some others may be adapted to particular caſes, but none is of ſuch extenſive application.

EXPEC-

EXPECTORANTIA.

Expectorants have been much talked of, but little underſtood. The diſcharge by the lungs ſeems to have ſomewhat in common with urine and perſpiration, but of this I ſhall not ſpeak poſitively. By *Expectorantia* here, we have only in view ſuch medicines as promote the ſecretion of mucus in the lungs. To talk of theſe is difficult. I have ſet down a long liſt; but, after attending a thouſand times to their operation, I am not able to ſay whether the effect produced depended upon the medicine, or nature. This ſhews the uncertainty, not only of medicines acting on the fluids, but of ſuch as are thence depoſited on the excretories, they being liable to ſo many changes in the *primæ viæ*, *&c.* before they get thither. Expectorants have been ſuppoſed attenuant. The difficulties regarding ſuch a power have been formerly mentioned. This ſuppoſition has been of bad conſequence in practice, having led us to employ a great number of acrid medicines in this intention. On this head Dr. Boerhaave has been extremely uſeful. In his Chemiſtry he very properly cautions us againſt the uſe of medicines of an acrid kind, in diſeaſes of the breaſt. In ſo far as our Expectorants are attenuant, they act only as ſtimulating the excretories. Poſſibly another action of them may occur, *viz.* that of antiſpaſmodic. Some medicines are diaphoretic from this quality, and hence I imagine *Aſſa fætida* acts as expectorant rather from its antiſpaſmodic virtue, by which it removes the obſtruction of mucus.

The four firſt plants in the Catalogue were mentioned among the *Verticillatæ*. They all contain an eſſential oil, acrid and inflammatory. Their virtues, as Expectorants, are not well eſtabliſhed by experience, and I imagine that, from their inflammatory nature, their uſe ſhould be conſidered as dangerous. Of three of them, *viz.* the *Hedera terreſtris*, *Hyſſopus*, and *Pulegium*, I never ſaw the expectorant effect. The virtue of *Marrubium* is perhaps greater, but then it is more acrid than any of the three mentioned, and I have

have never ſeen it tried. Analogy, and its ſenſible qualities, are againſt it.

ENULA CAMPANA.

This is much ſpoken of. I can ſay nothing concerning it from my own experience. It contains an acrid eſſential oil, and ſo is equally ſuſpicious with the laſt. It is, however, to be obſerved, that in diſtillation it gives out an oil reſembling Camphire, and a volatile ſalt, which ſhould lead to obſerve its medical properties. Elecampane is ſaid alſo to be laxative, and to act on the kidneys. I ſhould have obſerved, that Diuretics often prove pectoral. Perhaps we might invert the obſervation, and ſay, that, as pectoral, medicines may be diuretic. On this foundation, probably, a diaphoretic power has been attributed to the Elecampane. It has likewiſe been recommended as emmenagogue, but this virtue is liable to the ſame doubts as that of other medicines operating through the maſs of blood. Upon the whole, from this general method of talking, no application can be made to particular diſeaſes.

The next three, *Iris Florentina*, *Nicotiana*, and *Scilla*, are all emetic and purgative, only pectoral in conſequence of a common and univerſal ſtimulus, and in ſo far as by any means their other qualities are taken off.

IRIS FLORENTINA,

in its recent ſtate, is very acrid, but loſes that acrimony by drying, when, if it has any virtue at all, it is that of expectorant.

NICOTIANA,

under any preparation, is more powerful than the former, and may deſerve the praiſes of *Materia Medica* writers; but its acrimony, and ſenſible qualities, prevent its frequent exhibition.

SCIL-

SCILLA

is an univerſal ſtimulant and remarkably acrid ſubſtance. It acts as an Emetic, and in that intention is frequently employed, whether with any particular advantage I cannot determine. It is alſo purgative, with a hydragogue effect. Among Haller's Diſſertations, there are two upon Squills, where its conſiderable effect in hydropic caſes is obſerved, and that large doſes of it have proved a cure; but in ſuch caſe it is merely on the footing of the common hydropic purgatives. Carried into the blood, the Squill is diuretic; but in that view it oftener diſappoints than anſwers our intention. Its pectoral effects, though much cried up, as well as its diuretic, are very liable to deceive us; and it is very difficult to introduce the medicine ſo far. The only chance we have of ſucceeding, is this, *viz.* the diſſipation of the more volatile parts, by which means we prevent the immediate action in the ſtomach, and have a better chance of introducing our medicine, in greater quantity, into the maſs of blood. Hence almoſt always they ſhould be uſed dry. This drying, however, ſhould have bounds, which cannot be well fixed by a Phyſician. If Squills be dried in tunicles, it does not anſwer, and therefore it is very proper to cut it tranſverſely; for otherwiſe the drying is prevented, by the membrane covering the tunicles. When we want to extract the Squill by vinegar, in order to mitigate its taſte, or whenever we are to infuſe it in wine, or water, it ſhould always be in a dry ſtate; and this is a general rule with regard to all plants; for their common juices hinder the application of any menſtruum. Hence the London *Acetum ſcilliticum* is preferable to the Edinburgh. *Oxymel ſcilliticum*, with all the other *Mellita*, ſhould be rejected from the Diſpenſatory. We have induſtriouſly choſen freſh Squills in the *Pilulæ ſcilliticæ*. Theſe Squills ſuffer a change by drying, ſo that their doſe is very uncertain, and they become inſoluble; wherefore, in this preparation alſo, the dry Squills ſhould be employed.

TUSSILAGO.

The *Petaſites* belongs to this genus, and probably poſſeſſes the ſame virtues with the *Tuſſilago*. *Petaſites* is more acrid; whether or not it is a better medicine, I cannot ſay. Both have been famous for pectoral virtues. I ſhould have rejected the *Tuſſilago*, though ſupported by this reputation, had it not been for its uſe in the *Scrophula*. Dr. Fuller recommends it in his *Medicina gymnaſtica*, and mentions cure from it; and on frequent exhibition, I have found it of advantage. How it acts I do not know, as I do not know exactly the nature of the diſeaſe. From experience, I have great reaſon to believe Dr. Fuller in the right, and that *Tuſſilago* will ſucceed where ſalt water has failed. I uſed it in different ſhapes. I employed the recent juice in the quantity of ℥ij. or ℥iij. a day, and when the juice could not be procured, I uſed, like Fuller, the dry herb in decoction, and I believe with greater advantage. I find the diſeaſe oftenest in the ſpring, at which time the freſh herb is not in ſo perfect a ſtate as it may attain, and therefore I believe the decoction will be found the moſt convenient, as well as effectual method of exhibition. Many remedies are recommended in the *Scrophula*, and experiments ought to be made with them, in order to diſcover the nature of the diſeaſe. *Cynogloſſum* has been recommended in the ſame diſeaſe. I can ſay nothing concerning it, but that it is intitled to a trial.

BENZOIN, and STYRAX CALAMITA,

are remarkable for a volatile acid ſalt, which each of them gives out in diſtillation. How far this may be the foundation of their pectoral virtue, I cannot decide; for with reſpect to the *Flores Benzoini*, that virtue is as doubtful as in other pectorals. From any doſe in which it has been exhibited, no effects have been ſeen, and I have given it in the doſe of ℈j. and ℥ſs.

I take occaſion hence to alledge, that Benzoin, in officinal preparations, is of no other uſe, but as it gives an agreeable flavour.

PIX

PIX LIQUIDA

is properly an empyreumatic oil of vegetables.

SOAP.

Twenty years ago the reputation of Soap was very great. Many inſtances have been alledged of its effect in pectoral caſes, and I think I have obſerved ſome advantage from it. It has a better chance of ſucceſs than many others, becauſe it may be given in conſiderable quantity, which is very ſuddenly paſſed off by the kidneys, nay, even by the mucous glands; but this quality of it is probably only to be obtained by thoſe who can take it in conſiderable doſes.

GENERAL TITLES.

1. STIMULANTIA.

Under this head, I have referred to the *Umbellatæ*, as Aniſe, *&c.* There is a foundation for their pectoral virtue, in ſo far as they are generally diuretic. On the ſame footing the *Siliquoſæ* are referred to, of whoſe virtue there is undoubted evidence. We have formerly mentioned the uſe of theſe in hoarſeneſs. Their ſtimulus, though acrid, is not inflammatory, but from their great volatility, and its tranſient effect, very difficult to be conveyed to the breaſt, ſo that we are very often diſappointed of their effect. The beſt method of obtaining it is to introduce them entire, when, in conſequence of ſlower ſolution, they may be carried into the maſs of blood. As to the *Alliaciæ*, referred to at *d*, the ſame method of exhibition is requiſite, in order to obtain their pectoral virtue, as in the *Siliquoſæ*; and we ſhall never ſee Garlic diuretic, except when given entire. It is ſaid to be ſo penetrating as even to prove pectoral applied to the ſoles of the feet. But this penetration through our porous ſubſtance is not to be depended on.

2. ANTISPASMODICA.

Of theſe, as pectoral, I think I have as often experienced the good effects of Aſſa fœtida as any. Ammoniac is ſuppoſed peculiarly

adapted; but to me it is not ſo antiſpaſmodic as the former, and more heating and inflammatory.

3. DEMULCENTIA.

At *c*, to which I have referred, ſeveral Sweets are mentioned. I was doubtful whether I ſhould conſider theſe as pectorals, as being demulcent, or in conſequence of their ſaline ſtimulating nature. I incline to the laſt ſuppoſition, for Sugar ſtimulates the noſe and excites ſneezing. Perhaps in hoarſeneſs and catarrh their effects are really the ſame as they are alledged to be.

EMETICA.

What Vomiting is, it is not neceſſary for me to define; and in what ſtate of the ſtomach it conſiſts, I leave to Pathologiſts. With regard to this head, it would ſeem unneceſſary to mention the various effects of Vomiting; but as I find the effects of particular Emetics are not to be underſtood without a knowledge of the effects of Vomiting in general, and as I have little to ſay on particular Emetics, I ſhall enter a little upon that enquiry. Firſt, then, as to the various effects of Vomiting, or a ſtate of the ſtomach analogous to it.

1. Vomiting evacuates the contents of the ſtomach itſelf. It is not eaſy to know when that is fully performed. It is eaſy to ſee, that various matters may be detained in the *plicæ*, or *mucus*, ſo that frequent ablution muſt be required. Many have got now into a method of promoting few repetitions in Vomiting, and giving ſmall ablutions; but I think I can maintain, that by this method we diſappoint ourſelves of the effects to be obtained from a full evacuation. Small quantities of a medicine may excite vomiting, but that they will produce a full evacuation is very doubtful.

2. Vomiting cauſes a flow of liquors to the ſtomach, purges it, (if I may ſo ſay,) and emulges its mucous glands; which operation ſeems

ſeems not occaſioned by the ſtimulus, but produced in the ſame manner as in Senac's experiments.

3. Vomiting not only emulges the mucous follicles of the ſtomach, and promotes a flow of gaſtric liquor, but has the ſame effect in the neighbouring glands, eſpecially the pancreas and liver.

4. While Vomiting continues, it not only inverts the periſtaltic motion of the ſtomach itſelf, but alſo of the inteſtines, which pour out their mucus to be carried to the ſtomach, and evacuated with its contents. This ſerves to explain the throwing up of bile, but is by no means the common cauſe of it, for it is manifeſtly produced by ſqueezing of the liver and gall bladder, a proof of which is, that it occurs at the end of the operation; which throwing up of bile is, not without reaſon, thought a teſt of a Vomit's perfect operation, and was the rule to ſtop, of a Phyſician who employed Vomiting as a *panacea*. As ſqueezing the liver and gall bladder, Vomiting may puſh biliary ſtones into the inteſtines, and cure the jaundice; of which, however, I have frequently ſeen it a cauſe, becauſe Vomiting, by the ſame method of operation, might force the ſtone into the duct. As inverting the periſtaltic motion, Vomits are uſeful in diarrhœa and dyſentery; but, independent of that, they are probably more uſeful as purging the inteſtines, occaſioning a greater flow of liquors into the inteſtinal canal, which, if the Vomiting continues, are ejected by the ſtomach; a proof of which is, that the fæces are often thrown up; which again, by the bye, ſhows that the inteſtines may be inverted in the whole track. If the Vomiting ceaſes, the encreaſed ſecretion is carried off by ſtool, ſo that, at any rate, the adherent foulneſs is waſhed away. This alſo explains another point, *viz.* that, independent of being carried thither, Emetics may be purgative, by ſqueezing the track of inteſtines.

5. Vomiting ſqueezes, and occaſions a conſtriction of the whole abdominal viſcera, eſpecially the meſenteric glands, and in conſequence

quence pumps the whole lymphatic ſyſtem. On this account Vomiting has the power of encreaſing abſorption, as alſo from its evacuating property. Purges are, indeed, more frequently employed in that intention, but Emetics anſwer equally well. There are ſeveral inſtances of the waters of hydropic perſons evacuated by Vomiting, and I have had occaſion to obſerve ſuch a caſe.

6. As Vomiting occaſions a conſtriction, ſqueezes and emulges the whole abdomen, ſo I imagine it has the power of affecting the kidneys. Emetics, indeed, commonly do ſo, but this may be ſaid to be owing to the quantity of water drank along with them; but I think a great deal depends on the conſent between the two organs; for as irritation of the kidney will produce Vomiting, ſo, on the other hand, it is reaſonable to think that Vomiting may alſo act upon the kidney. Hence, Vomiting would ſeem uſeful in propelling ſtones in the kidneys. This, indeed, is difficult to determine, and ſome have imagined they are always dangerous in nephritic caſes. As to myſelf, I confeſs I am afraid of them, but others uſe them with ſucceſs and ſafety; and thus much may be ſaid for the practice, that it ſeems to be an imitation of Nature, which often excites a Vomiting in the caſes mentioned, and probably for good purpoſes. So much for the effect of Vomiting in the abdomen.

7. Theſe effects are, perhaps, extended to the viſcera of the thorax. I have obſerved to you, that the promoting of expectoration was very doubtful: I have ſeen it much oftner effected by Vomiting than by any other means. We may here obſerve, that the action of Vomiting is attended with obſtruction of inſpiration, as vomiting can only take place when the diaphragm is relaxed in exſpiration. The application of this will appear afterwards.

8. Vomiting increaſes the conſtriction of the fauces, and forcibly emulges the whole of the mucus and ſalivary glands. I have ſeen it

it have the effect of maſticatories, relieving rheumatic affections of the head, tooth-ach, &c.

By preventing inſpiration, Vomiting prevents the regurgitation of the blood at the end of expiration. The accumulating of blood produced by Vomiting is only momentary, and may be ſoon counterpoiſed, as we ſhall ſee by conſidering its advantageous effects on the ſyſtem in general.

1. During the time of Vomiting the pulſe is ſmall, weak, and intermitting.

2. If when Vomiting is over, the ſtimulus continues, the circulation is encreaſed, with a fulneſs and ſoftneſs of the pulſe, a determination to the ſurface of the body, and ſweat; this laſt may be ſuppoſed to proceed from the encreaſed circulation; but it may alſo from the conſent of the ſtomach and ſurface; and I think it is probable, that here, as in other caſes, an antiſpaſmodic virtue takes place with regard to the extreme veſſels, which is illuſtrated from this, that Emetics, combined with other Antiſpaſmodics, as Opium, encreaſe the virtue; ſo that combined they become more powerful Diaphoretics than each when alone.

Theſe are the primary effects of Emetics. With regard to the ſecondary, it is impoſſible to enumerate them all here. They will eaſily be deduced from their emptying the ſtomach, and encreaſing ſecretion and circulation, which may be a part of their antiſpaſmodic virtue, eſpecially in the extremity of the veſſels, as in the caſe of Fevers. On the conſideration of theſe we muſt not enter at preſent. I ſhall only ſay, that as the animal œconomy has numberleſs means of preventing diſeaſe, the Vomiting excited in the beginning of Fevers ſeems to be for good intention; and though it does not always cure, it may juſtly give indications.

After-

After thus mentioning the operation of Emetics, with regard to their ſalutary effects, we ſhall next mention the caſes where they are forbid.

1. They are forbid in all caſes of firm and obſtinate obſtruction, not to be overcome by the force of circulation. Hence in inveterate Scirrhoſities, in Calculi firmly impacted in the biliary ducts, Emetics ſhould not ſeem proper to be given; but as we have mentioned the uncertainty of the rule in theſe caſes, it may poſſibly be liable to the ſame in others. Poſſibly in Scirrhoſity, Vomiting not only extends its effects to the gland, but to the veſſels in the place of the obſtruction. This doubt ſhould point out an enquiry into the uſe of Emetics in the caſe of ſcirrhous viſcera. They have been known to be uſed with ſafety. There is one caſe, however, where caution ought certainly to be uſed with regard to them, *viz.* when the parts are lax and tender. In Scurvy, where there is a laxity of the veſſels, and in Cachexy, where there is the ſame tenderneſs, Vomiting muſt then be hurtful, and accordingly Phyſicians obſerve, that they are dangerous wherever there are ſtagnating putrefactive humours.

2. Wherever there is an encreaſed impetus already, we ſhould judge *a priori* that Vomiting is hurtful; but as it cannot be proved that it encreaſes the inflammatory diatheſis, Vomiting may happen to be employed with ſafety. Dr. Robinſon gives inſtances of inflammatory caſes where it was uſeful. He ſeems, indeed, prejudiced, and I have not tried its effects, but I have ſeen it employed in Peripneumony and Pleuriſy. Pleuritic pain was not encreaſed by it, which ſeemed to depend on Vomiting ſtopping inſpiration, in which that increaſe is felt; but ſtill in other caſes the Vomiting was hurtful, and much ambiguity occurs with regard to it, as I have learned from the practice of the perſon whom I mentioned as uſing Emetics in every inſtance. I ſhould not think in topical affections that Vomiting without bleeding could be ſafely preſcribed. It is not

uſed

uſed, as is agreed upon, in topical affections of the ſtomach itſelf, or in topical affections of the neighbouring viſcera.

3. In Hæmorrhagy it is not certain whether it is ſalutary. Robinſon, in his Eſſay on Emetics, maintains there is no more uſeful remedy in Hæmorrhage univerſally, and he gives examples of its good effects; and I have ſeen confirmation of what he advances. Practitioners have ſpoke of giving Emetics in ſpitting of blood. In the Infirmary I have exhibited them without bad effect, and perhaps it was for want of courage to continue them that they did not work a cure. There are certainly caſes where they may be uſeful; and uterine Hæmorrhage has been cured by the *ſtibium ceratum* when it vomited; and I have employed Ipecacuan with the ſame effects as well as Dr. Robinſon. In Dyſentery the good effects of Emetics are certainly confirmed, and they may be here in the ſame manner.

All this contradicts our theory. It may be ſaid, that in the time of Vomiting a conſtriction takes place over the whole body; but Robinſon obſerves, that the circulation is ſoon encreaſed, which is certainly inconſiſtent with the cure of Hæmorrhagy. Robinſon is of opinion, that Vomiting acts in conſequence of reſtoring an equable circulation. I imagine ſomething elſe muſt be taken in. In Hæmorhagy, as Dr. Hoffman obſerves, a ſpaſmodic affection often takes place, and Vomiting may act by taking off that ſpaſm. This reaſoning deſerves at leaſt conſideration.

4. Emetics are very dangerous in congeſtions of the head, in apoplexy, palſy, and in ſmaller collections in the veins of the brain. Vomiting may be ſuppoſed to puſh ſuch to the utmoſt violence, and to cauſe a rupture of the veſſels on which they depend. Many, however, alledge they are uſeful. It may be ſaid their conſtrictory power obviates their other effects. Indeed, I do not remember, in the annals of Phyſic, a fatal apoplexy produced by Vomiting. As

this effect, then, is not to be expected, their other good properties may then take place; and I have ſeen inſtances of them; though in thoſe inſtances they were exhibited much at random, nor can I particularize thoſe in which they are proper.

From the whole of what we have ſaid, it appears, that the bad effects of Vomiting are precarious, the good undoubted, and that its real virtue favours, in ſome meaſure, the ſuppoſition entertained by the practitioner we had occaſion to mention, of their being a *panacea*.

PARTICULAR EMETICS.

Particular Emetics differ in degree of acrimony, and in extent of their effects. I have forgot to mark in my Catalogue the great variety of them, and their gradation. I ſhould have mentioned *Warm Water*, which operates, from its bulk, in the ſame manner as cold water, and alſo from its nauſea. Impregnated with oil, it becomes more powerful, and the ſame with bitters, and other nauſeous additions. Next to theſe, Muſtard and Horſe-radiſh exceed in acrimony; and more acrid and more powerful than theſe are Squills, which indeed, if given dried, and in ſufficient doſe, are as acrid as any other emetics. After freſh Squills, and exceeding them in power, is to be placed Ipecacuan; and exceeding that again *Erigerum*, *Aſarum*, and *Nicotiana*. With regard to the gradation of the three laſt, I am not certain; *Erigerum* is more mild than the *Aſarum*. As to the rank of the foſſil Emetics, neither am I certain with regard to it. I forbear to mention particular Emetics, becauſe in doing ſo, I ſhould only repeat what we have ſaid on Emetics and Vomiting in general. None of them have a ſpecific virtue. We ſhall take this opportunity to ſay ſomething on Antimony, as its diſtinguiſhing property is its emetic power, although it might alſo have been referred to other heads.

ANTIMONY.

Antimony began very early to be the favourite of the chemical purſuits. It certainly affords us ſome very efficacious remedies, and this very efficacy of it was brought as an objection againſt its uſe, till of late theſe prejudices have been triumphed over, and its credit re-eſtabliſhed; not but that even now it is attended with ſome doubts. I ſhall therefore bring to your view its various preparations, ſhew the foundation of each, and their relation to each other.

Antimony conſiſts of a Regulus and Sulphur; this Sulphur was, for a long time, imagined to be of a particular kind, but this is now found to be erroneous; hence its peculiar medical virtues muſt reſide in its Regulus. To procure this, various means have been thought of and practiſed, which is a proof of the confuſion of their chemical knowledge. But they are all founded on the general rules applicable to the ſmelting of metals. We ſhall ſpeak of two kinds. Firſt, *Simplex*, with fixed Alkalies and Sulphur; or, ſecondly, *Martialis*, when with Iron.

The Chemiſts, indeed, have employed different metals, imagining they imparted different virtues to the Regulus, and even a combination of them; but the differences are rather in the quantity than quality of the Regulus; the preſcription of the London College coincides with the firſt method, where the Black Flux is uſed. The Crude Antimony and the Flux are ground together, and then thrown, in ſmall parcels, into a hot crucible; a deflagration enſues, and the Regulus is precipitated; part of the Sulphur is diſſipated with the nitrous Acid, part forms a *Hepar Sulphuris* with the remaining fixed Alk. which diſſolves ſome of the Regulus; for the purpoſes of arts, therefore, the Regulus is never prepared in this way, but by the other, viz. *Martialis*. Iron is here added to abſorb the Sulphur; but if too great a quantity is added, the ſuperfluity will unite with the Regulus. With regard to Iron, indeed, this addition would be harmleſs, but not ſo if we made uſe of other

metals. When we have thus got the Regulus pure, we have a ſubſtance capable of being acted on by the Acid in the Stomach, hence the *Perpetual Pills*, which are emetic and cathartic. This is the only ſhape in which the pure Regulus is employed.

Crude Antimony ſhould, from a general principle, be inert, as we have ſaid of Mercury, Sulphur, &c. but though experiment confirms that in general, and I have given it triturated to ʒij. without any effect; I have no leſs ſeen it raiſe a vomiting, &c. like the other preparations. This we muſt account for from the different ſtrength of the Acid in different perſons, and in the ſame perſon at different times. Moreover, different portions of Antimony have different quantities of Sulphur, and it is alledged, that even the ſame cone differs in different parts of it, that there is more Sulphur at the baſis than at the apex. Hence in preſcriptions we have directions what part to take it from. From this uncertainty of the material circumſtances neceſſary to its action, its crude ſtate is looked on as an inaccurate medicine. To render it more certain we abſtract part of its Sulphur, and that is done,

Firſt, by Alkalies. If Crude Antimony is fuſed with four-fifths of its weight of common Salt, and one-fifth of a fixed Alkali, the Regulus falls to the bottom, and the Sulphur floats on its ſurface in form of *Scoriæ*. This is the *Regulus medicinalis*. This was taken from a preſcription in great vogue in Germany, called the *Febrifugium Cranii*. The common Salt is added only to float on its ſurface, and prevent the acceſs of the air. This proceſs has been variouſly diverſified; ſome have choſe to add vitriolated Tartar. The ready fuſion of this is a curious circumſtance; but the effect is ſimilar to the foregoing.

Another method is the preparation of the Kermes Mineral. This was a curious ſecret in France, firſt invented by Glauber, afterwards in the hands of the Carthuſians, at length the preparation was purchaſed by the French King, and made known.

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A quantity of Crude Antimony is boiled in a lixivium of Salt of Tartar; the Sulphur forms a Hepar with the fixed Alk. and ſuſpends part of the Regulus. When this is decanted and ſet to cool, part of the Regulus with its Sulphur falls to the bottom in a red powder. The quantity of Sulphur is not, however, ſufficient to prevent its being acted on by the Acid of the Stomach.

The *Sulphur auratum Antimonii* is of the ſame nature, but milder than the foregoing. There are various ways of making it; one is of taking the ſcoriæ of the *Regulus ſimplex*, and putting them into boiling water; on cooling it falls down in a powder. The Chemiſts thought this too ſimple a proceſs, and hence thought proper to add Acids, which precipitate the Sulphur in greater quantity, but of leſs efficacy, and leſs impregnated with Antimony. But there is no certainty in any of theſe; for they will vary according to the different times of the precipitation; the different ſubſidations of the ſame proceſs ſhould be intimately mixed; but we never can be ſure that we have the ſame power in different preparations.

Antimony is likewiſe deprived of part of its Sulphur by Nitre. I am not certain of the accuracy of attributing this ſeparation to the Nitre, but it is rather owing to the action of its parts ſeparately, in the decompoſition of it, when the Acid carries off part of the Sulphur with it, while the Alkaline abſorbs the reſt, and forms an Hepar Sulphuris. This proceſs is diverſified according to the quantities of Nitre uſed. If we uſe an eighth part we obtain the *Crocus Antimonii medicinalis*; only as we increaſe the quantity we make the preparation more and more acrid, till we arrive at equal parts of each, which is the *Crocus Metallorum*. If we go on increaſing the Nitre it grows milder; on the oppoſite ſide, if we uſe one and a half of Nitre to one of Antimony, we obtain the *Crocus Metallorum mitis*; if two parts of Nitre to one of Antimony, we obtain the *Pulvis Corrichius*, or James's Powder, or the Emetic Nitre of Boerhaave.

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I never could diſcover the power of diaphoretic Antimony; for three parts of Nitre will render it an inert ſubſtance. I believe we ſhould to four of Antimony take only ſeven, perhaps ſix and an half of Nitre; nay, perhaps only ſix; we may then get a powder that will act as an Emetic and Diaphoretic; but it is not reduced to any proper ſtandard.

Secondly, By Calcination. If we treat it with a heat leſs than is neceſſary for its fuſion, we do much the ſame as by adding Alkali, *viz.* deſtroy part of the Sulphur; but as we continue to evaporate more Sulphur we calcine more of the Metal, and during the calcination ſomething is added to the Metal from the fire, which renders it inert; but if we afterwards increaſe the fire ſuddenly, we bring it to a glaſs, and in that ſtate it is capable of being acted on by all the Acids.

Thirdly, By Sublimation. The *Flores Antimonii* are procured by joining aludels to each other, and then ſubliming the Antimony. In the fartheſt aludel we ſhall find moſt Sulphur, in the neareſt moſt Antimony.

Of REGULUS of ANTIMONY combined with ACIDS.

With the Muriatic. Antimony may be combined with this in different ways, but not conveniently, unleſs it is in a concentrated form. Different compounds are therefore made uſe of for this purpoſe, but chiefly the Corroſive Sublimate. In this caſe the Muriatic Acid joins the Antimonial Regulus, while the Mercury unites with the Sulphur. In diſtilling this we procure the Butter of Antimony; on repeating the diſtillation it comes over thinner, under the name of *Oleum Antimonii*. If the operation is urged farther, the Cinnabar of Antimony comes over, which has really no Antimony in it, and only the properties of common Cinnabar, and equally inert. I know no alteration that is made by uniting it with any other ſalts that contain Muriatic Acid. We may treat it with

with Sal Ammoniac in the ſame manner we mentioned of Mercury. When thus united with the Muriatic Acid, it is one of the moſt corroding ſubſtances we can apply to the body, and only uſed in this fluid corroſive form externally. For internal uſe we muſt abſtract a part of its acid; this is effected by adding water; the moſt ſoluble and acrid part is accordingly diſſolved, and part of the Antimony precipitates, which is abſurdly called the *Mercurius Vitæ*.

Stahl recommends ardent Spirits inſtead of Water; this throws it down in a finer powder, but I know not that it has any other effect on it.

The Chemiſts have proceeded to the calcination of it, in order to diſſipate more of the acid; and I ſee from Senac, that it has been uſed in this way, though I know of no particulars relating to it.

Of its UNION with the NITROUS ACID.

Firſt, Antimony, if calcined with Nitre in this proportion, *viz.* three parts of Nitre to one of Antimony, the Regulus is fully ſaturated with nitrous Acid, and forms a diaphoretic Antimony inert, and not ſoluble in our fluids.

Secondly, By adding Nitrous Acid to Butter of Antimony, it attracts the Regulus from the Muriatic Acid, but only corrodes it, and brings it down in the form of Bezoar Mineral.

This is perfectly inert, from the ſuperfluity of Nitrous Acid, and caſt out of our Diſpenſatory.

Its UNION with the VITRIOLIC ACID.

It precipitates the Regulus from the Nitrous Acid, and has much the ſame effect. It is not uſed.

With the VEGETABLE ACID.

This Acid will act upon Antimony in its crude ſtate, if its ſulphur be in ſome meaſure abſtracted. The action of this Acid is obſerv-

obſervable, too, on the Regulus, or when the crude Antimony is a little calcined, or in its vitrified ſtate, or when precipitated from other acids; the effect of all theſe is the ſame when acted on by the Vegetable Acid. We generally uſe the acid in a dilute form, *viz.* that of wine, as in the *Vinum Antimoniale* and *Benedictum* of the ſhops.

The ſpirituous ſtrong Portugueſe wines are not ſo good for this purpoſe; the lighter French wines, or the more acid, as the Rheniſh, make a ſtronger ſolution of it, and our own home-brewed wines exceed either. For theſe reaſons I am often diſappointed with the *Vinum emeticum* of the ſhops, while that of our Infirmary never deceives me. Vinegar might, perhaps, anſwer better, and, brought into a proper form with ſyrup, might make an elegant preſcription. The Acid attracts it in very ſmall quantities, and always in a certain proportion, ſo that the quantity and concentration of the Acid being given, the ſtrength of the medicine is known. One ounce of *Crocus Metallorum*, or Glaſs of Antimony, may ſerve an Apothecary his life time, and an ounce of the wine is the general doſe.

To get it in a more concentrated ſtate we employ Tartar. We diſſolve in water as much Tartar as we can, by the aſſiſtance of boiling, and then add Crocus, or Glaſs of Antimony; on cooling it falls down in cryſtals, and forms the *Emetic Tartar*. This method of cryſtallization is precarious, and cannot well be practiced; we therefore evaporate to dryneſs, and afterwards blend the whole by trituration. It is not eaſily ſoluble in water, the more ſaline part will be taken up, and the more antimonial left; to obviate this the French have uſed the Soluble Tartar, and thus they may give it in drops.

Of the MEDICAL VIRTUES of ANTIMONY.

Antimony is purely ſtimulant, it no where ſhews any aſtringent, tonic, or ſedative power, or, if it ever does, it is in conſequence of its ſtimulus. It certainly ſtimulates very readily, as a very ſmall quantity will act as an Emetic. It has long been a great deſideratum to get a preparation that would act on the other parts of the

ſyſtem

ſyſtem without this effect. When it paſſes the ſtomach, and acts only on the inteſtines, it acts as a Purgative. I doubt much if it acts as a Diuretic or Sudorific by being properly applied to the organs of theſe evacuations, and rather imagine that it produces theſe effects by acting on the ſtomach and inteſtines. It is difficult to conceive this, though we evidently ſee its effects on the ſurface or kidneys, ſometimes before it can poſſibly have arrived there. Other Emetics certainly do the ſame.

It is certain, from matter of fact, that, from its action on the ſurface, it can both ſtimulate and relax the veſſels on the ſurface of the body, but this is common to it with other Emetics, to produce conſtrictions on the ſurface, and hence its ſervice in hæmorrhages; that, however, is in conſequence of the nauſea it creates.

Of its FEBRIFUGE QUALITY.

It is no difficult matter to ſhew teſtimonies of efficacy, adduced in favour of the moſt inert medicines. But I allow that practitioners of candor and diſcernment acknowledge the virtue of James's powder; and, indeed, the *Pulvis Cornachini* and *Antiquartzium of Riverius*, medicines of a ſimilar nature, have been extolled with the ſame commendations. I imagine, that, by acting on the ſtomach, it produces a diaphoreſis, by relaxing the ſpaſms that take place on the ſurface. But what is the proper form in which it ſhould be exhibited? Such a proportion of Nitre ſeems to be neceſſary as will leave it to be acted on by the acid of the ſtomach, and that ſtimulus ſhould not be too great, but that it ſhould ſuffer it to paſs into the inteſtines. For this purpoſe Cornachinus adds Scammony, and James adds Mercury, *viz.* a preparation of it in the Nitrous Acid. But the Tartar Emetic is as much in uſe as any of them, and is at preſent the favourite Febrifuge in France and England, when joined to Glauber's Salt to inforce its action. The action of the Tartar Emetic is much ſlower that that of the *Vin. Emeticum*, hence preferable, as it is longer before it produces a nauſea. It may be conveniently given in form of a bolus.

CATHARTICA.

Theſe are medicines which evacuate by ſtool. They are called Cathartics, or Purgers, by way of eminence, from a groſs view, they being ſuppoſed to carry off all the impurities of the body; but the term muſt be conſidered only as metaphorical. Here, as under the head of Emetics, we ſhall mention the effects of the medicines at preſent.

1. They evacuate the ordinary contents of the Inteſtines. As this is a neceſſary operation of the animal œconomy, and not occaſional and accidental, as in the caſe of vomits, they have been conſidered as medicines friendly to nature.

2. Beſides evacuation, by exciting a more active periſtaltic motion, Cathartics ſqueeze out the glands of the Inteſtines, and occaſion a greater afflux of inteſtinal liquors, *&c.*

3. As operating on the whole alimentary canal, they draw alſo from the Stomach. Whether it is peculiar to any to be ſtomach purgers, we may afterwards conſider. From all theſe conſiderations, their evacuating property muſt be very great.

4. They alſo evacuate the whole glands of the Inteſtines, and thoſe which pour their liquors into them, particularly the pancreas and liver, by expeding the circulation, in which laſt they have effect on the ſpleen, and all the abdominal viſcera. If there is a certain connection between ſecretion and abſorption, by encreaſing the former they promote the latter. Hence they are called Hydragogues, not only as evacuating, but occaſioning the abſorption of water which has ſtagnated in any cavity.

From this view of their operation our medicines might be conſidered as Cathartics in general, and if the evacuation be continued for

for a length of time, they may moſt certainly purge. But this conſtant evacuation is not to be ſupported except by repetition of acrid medicines, which is a dangerous practice, and only to be applied to bodies of a lax flaccid kind, ſo that ſtill we muſt refuſe them as general purgers. Upon this plan we may object to their uſe in the *Lues venerea*, and I doubt whether we can ever continue them ſo long without danger, as to change the whole maſs of fluids. Hence the diſcharge by ſalivation, urine, *&c.* is preferable. You ſee even the ſame objection holds againſt Salivation, and this becauſe both are attended with inflammation of the parts where the medicine is collected and applied.

5. The evacuation by ſtool, and derivation to the inteſtines, neceſſarily determines more blood into the deſcending aorta, where, in conſequence of the revulſion from the head, I have no doubt of their encreaſing every evacuation, ſo that, therefore, Cathartics may very probably be conſidered as promoting the menſtrual flux, opening obſtruction in the uterus, and uſeful in waſhing off the virulency of *Gonorrhœa*, uſeful in Ulcers, by evacuating the ſyſtem in general; to Ulcers in the inferior part of the body, as cauſing a greater flow to the part.

6. Cathartics have a ſtimulant power, which, as applied in the inteſtines, excites or at leaſt aggravates inflammation in them; nay, ſome of them there are which will propagate the ſame over the ſyſtem. Again, there is hardly a purgative, which, conveyed into the maſs of blood, is not diuretic and pectoral. Theſe are in general the operations of Cathartics.

As repeated Emetics weaken the ſtomach, ſo Cathartics often renewed, diminiſh the tone of the inteſtines, and their ſenſibility, and ſo,

1. Partly by this, and partly in conſequence of mere evacuation, their frequent uſe renders the inteſtines very liable to irregular ſpaſmodic affections.

2. Of moſt Purgatives the acrimony is of an inflammatory nature, not only exciting inflammation in the part to which they are applied, but acting in the ſame manner as poiſons. Narcotics, as the *Nicotiana*, are accounted purgative, much oftner are Purgatives narcotic.

3. The inflammatory ſtimulus is extended to the ſyſtem, and produces or aggravates Fever and inflammatory Diatheſis.

4. Their inflammatory ſtimulus is directed to the *rectum*, through which the whole acrid matter muſt paſs. Hence all Purgatives encreaſe hæmorrhoidal ſwellings.

5. They not only inflame the *rectum*, but alſo extend the irritation to the *urethra*. Theſe effects are varied in particular caſes. This finiſhes what we were to ſay on the good and bad qualities of Cathartics in general.

PARTICULAR CATHARTICS

are of two kinds. Acids poured more copiouſly into the bile, give it a purgative quality, and the ſame effect will enſue from a more copious Acid produced in the ſtomach paſſing into the inteſtines. The two kinds of Cathartics then, are, 1. Acids, or aceſcent aliment; 2. Medicinal ſtimulants, whoſe acrimony is fitted to purge.

The *Fructus acido dulces*; *Prunes*, *Tamarinds*, and *Caſſia*; *Serum lactis*, *Lac ebutyratum*, and *Olera blanda*, have all their chief effect in conſequence of their aceſcency in the ſtomach. In ſo far as they contain ſugar, they ſtimulate the inteſtines, which we may conclude from the effect of ſugar itſelf applied in glyſters.

Medicinal Stimulants differ greatly in their degree of acrimony, and ſo in their purgative effects. It were proper to arrange them in

in this order. Firſt, I would put *common water*, which, in conſiderable quantity, is purgative, operating by its bulk, ſtimulating the periſtaltic motion, thus puſhing forwards the contents faſter, and evading the abſorption by the Lacteals. Thus many Mineral-waters act.

Next I would inſert *Bland expreſſed oils*; theſe, when taken in ſuch quantity as to evade changes in the ſtomach, may prove laxative, but, like water, I believe it is chiefly from their bulk. Simple Oil is employed in the *Colica Pictonum*. I have ſeen it given in the quantity of ℔j. but its action ſeemed always to be in the way we alledge.

After theſe we may place *Soap*. With regard to the operation of this, I am doubtful. Though mild to the taſte, it has the power of ſtimulating the inteſtines, and proving purgative. This it will ſometimes do in the quantity of ʒj. and at other times the effect is not conſiderable from ʒiij. This has led me to imagine, that Soap has no effect but when decompounded in the ſtomach. Soap, as contaminated with common ſalt, may owe ſome of its irritability to it. Accordingly, upon uſing the Soap made from Lewis's direction, without common ſalt, I never found it purgative.

Following this I ſhall mention *Sulphur*, which, in its perfect ſtate, is mild and bland. The theory of the action of this is as difficult as that of Soap, for, in ſpite of its mildneſs, it is ſtimulating to the inteſtines. Whether our fluids have the power of diſſolving it, I cannot ſay. It is certainly a mild and ſafe Cathartic, never producing any conſiderable evacuation, but keeping up the natural excretion without any irritating or heating effects. I have frequently had occaſion to employ it, where irritation would have been harmful, and coſtiveneſs encreaſed the diſeaſe, *viz.* in uterine hæmorrhoidal hæmorrhagy, and there it was effectual without inconvenience. Sulphur has been accuſed of griping, but I imagine this is owing to its having ſuffered that deliqueſcence to which we know

know it is liable; for in that condition its purgative property diſappears, and the griping takes place, which gives us a caution to uſe our Sulphur always in a mild ſtate, or previouſly to waſh it.

I muſt here inſert one or two medicines, of which I am not certain whether they be entirely in their place. *Muſtard* is capable of ſtimulating the ſtomach and inteſtines. Its effect, as a purgative, is only to be obtained when it is entire, and then given in the quantity of ʒſs. or ʒj.; if not purgative, it keeps up a regular excretion.

Next I would place *Bile*, which, as ſuited by nature to promote evacuation, might be ſuppoſed to have that effect when introduced into the body in a larger proportion. Accordingly it has been recommended. I have made experiments with it; but whether it be that Bile has really no effect, or whether I may have fallen ſhort of the proper doſe, it is certain I did not ſucceed with it. I gave inſpiſſated Bile in the quantity of ʒſs. but on continued practice never found from it any ſenſible effect.

Approaching next to theſe mentioned in mildneſs are the *Saline Purgatives*, and of theſe, in the firſt place, *Sugar*; and, connected with it, *Honey*, *Manna*, and the *ſweeter Fruits*. Indeed their purgative quality ſeems ſomewhat contrary to their Sugar; thoſe containing moſt of it not being ſo purgative, as Tamarinds, *&c.* Hence I would ſay, that none of theſe can be conveniently employed, except where we may put up with the effects of aceſcent fermentation.

Next in order come *fixed Alkalis*, of which we have formerly ſpoken.

Tartar acts more conſiderably by its neutral qualities, and the *Magneſia Alba* is only purgative as converted into a Neutral, ſo that this is the proper place for conſidering *Neutral Salts in general* as Purgatives, and for marking out their peculiar differences. The fixed

fixed Alkali is only purgative as converted into regenerated Tartar.

Where acidity prevails Magneſia is preferable to other Neutrals, but it is uncertain whether it is ſo to other abſorbents.

Neutral Salts taken internally ſtimulate the ſtomach, excite appetite, and promote digeſtion; hence the term *digeſtivum* applied to one of them. Since Neutral Salts are directly ſtimulant, as we ſee by their effects on the ſtomach, and by their ſometimes producing vomiting, we give them in divided doſes. Some of the Neutral Salts, however, are remarkably antiemetic, ſedative, and refrigerant. Hence their uſe in fevers, inflammations, and hæmorrhagy. When uſed frequently, or in large quantities, they impair the tone of the ſtomach, bring on flatulencies, and weaken the inteſtines, as is ſeen by the frequent uſe of Nitre, Glauber's Salts, *&c.* They have in ſome degree a ſedative power, and ſometimes a diaphoretic one, which they exert in the ſame manner that a draught of cold water does. They are of uſe in the cold fit of an ague, by promoting a critical diaphoreſis. In like manner they ſtop vomiting, by determining to the ſurface of the body. Cuſtom has given a preference to the Neutrals made with native vegetable acids, before the artificial, as Vinegar, but I know not upon what foundation. It is obſerved, that the Neutral made with the Volatile Alkali, as an antiemetic and ſudorific, is preferable to regenerated Tartar. When admitted into the inteſtines they act as purgatives, and pretty ſharply; and hence, from the quantity and * ſuddenneſs of the evacuation, uſeful in feveriſh diſorders. However, their ſtimulus is inconſiderable, and is not extended, as in moſt other purgative medicines, over the whole ſyſtem. Their † relaxing qua-

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* Hence thoſe Neutrals that are the moſt ſtimulant, as thoſe of the muriatic kind, are thought beſt in Fevers.

† Hence perhaps one of their uſes in inflammatory complaints. They have likewiſe a ſedative power.

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lity makes theſe Salts improper for thoſe who have a lax tone of their ſtomach, as hyſteric and hypochondriac perſons. In obſtinate coſtiveneſs they are given in ſmall quantities, *viz.* one quarter of a doſe in an hour, until the quantity of two or three doſes are taken, and this often with the beſt effect. All Neutral Salts prove purgative; but as ſoluble Tartar has no diſagreeable taſte, it ſhould be, on that account, preferred, was not its operation ſo very precarious, as the acid of Tartar is ſeparated from its Alkali by every other acid, and hence would be decompoſed by the acid of the ſtomach. Hence it is generally given as an abſorbent. As the quantity of fixed Alkali is but ſmall, it will not be very purgative by the effect of the Acid it finds in the ſtomach, as this combination is leſs ſtimulant to the inteſtines than ſoluble Tartar. Regenerated Tartar has no peculiar efficacy, and when exhibited requires a large and expenſive doſe. Vitriolate Tartar is given as a purgative, in doſes from two to four drachms, but neither this, nor the *Sal polychreſtum* is often uſed, on account of its difficult ſolution in water, and the great increaſe of the bulk of the doſe on that account.

Hence Glauber's Salt is preferred, which, though of eaſy ſolubility, have a moſt nauſeous taſte, but this may be in ſome degree alleviated, by the addition of Aromatics, among which I think nutmeg has the beſt effect, with ſome ſweet ſubſtance added to it, which would coincide with the purgative intention. I find but little difference between the medical effects of the true, and the Magneſia Glauber's Salt. Neutral Salts, though in the largeſt quantities we could exhibit them, when diluted, can have very little effect upon the fluids as introduced into the body. Some have alledged, that they cool and allay the heat of the blood, becauſe all the Neutral Salts, when powdered, and thrown into water, generate cold. But it is only during their ſolution that they have this effect; ſo that they would be moſt likely to exert theſe effects, if given in form of a bolus, as, when the Salts are already diſſolved, they have no farther effect in producing cold. Perhaps by their cooling power they may ſhew ſome ſmall ſedative effects on the

the ſtomach, but theſe would be trifling. Their antiſeptic quality is very ſmall. But although they cannot much affect the maſs of blood, they ſhew very conſiderable effects on the ſecretory organs, and hence very powerful diuretics and diaphoretics. On this may be founded the virtues of many Mineral Waters impregnated with Neutral Salts.

All the medicines hitherto mentioned are *Eccoprotics*, or thoſe laxatives of a more gentle and cooling kind. All thoſe afterwards to be mentioned muſt be conſidered as having an inflammatory ſtimulus, though ſtill we are to ſpeak of a few which muſt be ſeparated from the acrid Purgatives.

All thoſe plants enumerated formerly under the title of *Amara calida*, are more or leſs purgative. *Chamæmile flowers* are ſo much ſo, that this quality is the chief hindrance of their being effectual in Intermittents.

More powerful than thoſe may be conſidered the *Fætid gums* enumerated among the Antiſpaſmodics. In their purgative effect they all approach to the nature of *Aloes*. Though the fœtids juſt now taken notice of are Bitters, tho' the Bitters mentioned before them are purgative, and though Aloes be bitter, yet a Purgative is not a common quality in Bitters, and therefore in Aloes, *&c.* is to be conſidered as a peculiar property.

ALOES.

If any medicine be entitled to the appellation of a ſtomach purge, it is certainly Aloes. It is remarkable with regard to it, that it operates almoſt to as good purpoſe in a ſmall as in a large doſe, that five grains will produce one conſiderable dejection, and twenty grains will do no more, except it be, that in this laſt doſe the operation will be attended with gripes, *&c.* Its chief uſe is to render the periſtaltic motion regular, and is one of the beſt cures of habitual

bitual coſtiveneſs. There is a difficulty we meet with in the exhibition of Purgatives, *viz.* that they will not act but in their full doſe, and will not produce half their effect if given in half the doſe. For this purpoſe we are chiefly confined to Aloes. Neutral Salts in half their doſe will not have half their effect, although even from theſe, by large dilution, we may obtain this property; but beſides them, and our preſent medicine, I know no other which has any title to it, except Sulphur. Aloes ſometimes cannot be employed. It has the effect of ſtimulating the rectum more than any other, and with juſtice has been accuſed of exciting hæmorrhoidal ſwellings, ſo that we ought to abſtain from it in ſuch caſes, except when we want to promote them. Aloes has the effect of rarifying the blood, and diſpoſing to hæmorrhagy, and and hence it is not recommended in uterine fluxes. Fœtid gums are of the ſame nature in producing hæmorrhagy, and perhaps this is the foundation of their menagogue power.

BALSAMICS.

Theſe have the power of ſtimulating the inteſtines, and are next in virtue to Aloes, being very proper to overcome a coſtive habit, and peculiarly uſeful where the coſtiveneſs is attended with great ſpaſms, as in the dry belly-ach; they are more heating to the whole of the ſyſtem, and produce more copious evacuations. Of theſe the whole variety, as Turpentine, *&c.* may be uſed. Turpentine, on account of its difficult diffuſibility, is not very proper. The moſt convenient, and perhaps the moſt efficacious of all, is Gum Guaiac, which is found an uſeful Purgative in all caſes of obſtinate Coſtiveneſs, where there is no danger from its heating quality. We are apt to miſs the effects of this in a ſolid form, and therefore it ſhould be well diſſolved in mucilage, or yolk of egg. With ſugar it is not ſo effectual, depending more on the ſolvent powers of different ſtomachs.

Before we come to the Purgatives which may be properly ſtiled acrid and ſtimulant, we ſhall juſt mention a few mild ones, ſet down

down before the former, which was done with ſome view of inſerting them according to the order of their virtues.

Of *Violets* and *pale Roſes*, the purgative virtue is little to be depended upon.

Polypody has inconſiderable effect as an aperient Purgative. It does not operate in the doſe of ℥j. ſo that exhibition in large quantities is neceſſary to its operation.

All the Purgatives inſerted in our Catalogue, after the title *Antiſpaſmodica*, are,

Acrid Purgatives, of which *Materia Medica* writers ſay very little but what concerns their natural or chemical hiſtory. With regard to the firſt, we have, in general, purpoſely avoided it. Little has been obtained from the chemical hiſtory, nor is it yet determined in what ſubſtance the medicinal powers reſide. Not one of the analyſes are perfect, and thoſe who have made them, *e. g.* Boulduc, Neuman and Cartheuſer, are contradictory to each other. They differ only as more or leſs acrid, from the different degrees of which acrimony and ſtimulus, they have been diſtinguiſhed in Cholagogues, Phlegmagogues, and Hydragogues.

Rhubarb has, beſides its purgative quality, an aſtringent one, and hence is peculiarly adapted to the dyſentery. It alſo has a bitterneſs joined to it.

Seneka affects the ſtomach, inteſtines, and excretories. In order to make it prove purgative or diuretic, it ſhould be given at intervals, largely diluted.

Geniſta is frequently recommended in dropſies. It is an uſeful diuretic. ℥ſs. of broom tops, managed like Seneka, will produce the ſame effects. Aſcites is accompanied with flatulency. Purgatives that expel wind are the beſt in that diſeaſe, and the Geniſta anſwers that purpoſe.

Senna. Whether there be any foundation for this being one of the beſt purgatives, I cannot ſay, nor have I been able to find it. It is as acrid and inflammatory as any. It ought to be infuſed in a large proportion of water, which is preferable to decoction, in ſo far as the purgative quality reſides in a volatile part, which flies off by the treatment. This volatile part, obtained by the largely diluted infuſion of Senna, is that whoſe operation is moſt gentle and eaſy. Juice of Lemons and Cream of Tartar correct the bitterneſs of our preſent ſubject.

Helleborus niger is commonly placed among the moſt acrid purgatives. It is to me a medicine of uncertain qualities. As employing it in infuſion or extract, I have been diſappointed of its effects as a purgative at all. It has alſo been recommended as a powerful emmenagogue by Dr. Mead, but I have never met with inſtances of its efficacy.

The five next are all ſpecies of the ſame genus, the *Convolvulus*, and are exotics. Our common *Convolvulus* deſerves a trial, to ſee if it poſſeſs the ſame virtues.

Mechoacan is remarkably mild, with little ſenſible taſte.

Jalap is neither more violent in its effects, as a purgative, than Senna, nor is it ſo griping. If any purgative be diuretic, this is remarkably ſuch, when treated like Seneka by decoction, which diſſipates its virulent acrimony.

Scammony has been always placed among the acrid purgatives. Its taſte is not very diſagreeable. It requires to be diffuſed in water; is frequently adulterated; I imagine it has ſomething of the nature of aloes.

The purgatives that follow are more acrid than thoſe we have mentioned, but none of them have any ſpecific powers.

Colocynthis, *Cucumis Aſininus*, and *Elaterium*, to which might have been added *Bryonia alba*, belong to the natural order of the *Cucur-*

Cucurbitaceæ. Their virtues reſide more or leſs in a volatile part, and their effects are obviated by boiling.

The metallic Purgatives follow next.

Gold. This is not active in its metallic ſtate, or when taken up by oils, but very much ſo in its ſaline ſtate. For this it muſt neceſſarily be diſſolved in *Aqua regia.* It is a ſtrong cauſtic, whether uſed in the ſolution, or a precipitated or dry ſtate. It may be brought into a dry form two ways; firſt, either by evaporating to dryneſs; or, ſecondly, by precipitation with Alkalies. In the latter ſtate it is called *Aurum fulminans.* This was in great vogue, but its certain effects are not know. It has been ſometimes employed with advantage, and in other caſes done harm. The *Pharmacop. Edinenſis* uſed it after waſhing it from its acids; but in this ſtate, though not ſoluble in watery fluids, yet it may, like other precipitated metals, be acted on by the weaker acids, as that of the ſtomach. Hence its action would depend, in a great degree, on the quantity of acid preſent there, and hence too are derived the various accounts of its effects. In general it acts as a purgative, ſometimes as a diaphoretic, and, like other metallic preparations, is alſo anthelmintic. It may be eaſily over doſed, and at beſt dangerous, and therefore very properly left out of the *Materia Medica.* Geoffroy's way of preparing it was to evaporate a ſolution of Gold to dryneſs, and then to triturate it with regenerate Tartar, by which it became ſoluble in ardent ſpirits. The theory of this is very difficult.

Silver. This metal is inactive in its metallie form, nor can it be rendered ſaline by the acid of the ſtomach, unleſs when precipitated from the Nitrous Acid, and this ſhould be pure and without any admixture of the Muriatic. Two parts of water added to Glauber's Spirit of Nitre is the beſt proportion. A ſolution of Silver in the Nitrous Acid, evaporated, fuſed, and caſt into a mold, gives us the lunar cauſtic. This is often employed externally as a cauſtic, but

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where a quick effect is desired, it does not succeed so well, as it is deliquescent. It is useful as a styptic, and may answer as a detergent. Internally it may be of service, when the crystals are rendered milder, by extracting part of the acid. Lewis, in the New Dispensatory, has given the best directions for this. It has been employed chiefly as a Purgative. Boerhaave and Boyle recommend it much in hydropic cases, as evacuating the contents of the viscera by stool and urine with great ease, but a long use of it hurts their tone. I have tried it, but have not found it answer; it required considerable quantities, and was far from acting easily.

Ward used to give an hydropic purge, which acted much in the same way they speak of this. That published in his book of Receipts, with many others, are probably very different from those which he himself used.

Mercury and Antimony have been before treated of.

DIURETICA.

The effect of Diuretics is very uncertain. Many medicines are enumerated as having a diuretic quality, but there is not one of them that exerts it always, nor any to a considerable degree. There is not a more powerful stimulus to the kidneys than Cantharides, and yet even the effect of these was not steady, although at the same time I have seen them produce a strangury. Dr. Ward's powder is the only certain Diuretic. This is probably owing to the diffusion which all the medicines passing through the mass of blood are liable to, and also from the medicines mentioned by *Materia Medica* writers relieving only diseases of the kidneys. There is evidence of many Astringents, besides the *Uva Ursi*, being in the list of Diuretics. A Physician wrote a Dissertation, published forty years ago, entitled, *De Calculo Astringentibus curando*, and I do not doubt but Astringents may sometimes promote this evacuation. I am told that Storck, in a late book, his *Annus Medicus*, recommends several Astringents, in obstinate cases of the *Colica*

fica Pictonum, which ſufficiently ſhews the uncertainty of the operation of any medicine.

The operation of Diuretics does not depend on their changing the conſiſtence of our fluids, and I have no doubt in ſaying, that univerſally they act either by a ſtimulus directly applied to the kidneys, or to the parts conſenting with them. That the kidneys may be affected by conſent, appears from there being a copious flow of limpid urine in hyſteric paroxyſms, in the ſame manner as nephritic affections cauſe vomiting. It is from acting in the Inteſtines that purgatives, I imagine, exert their diuretic power, at leaſt it is very doubtful if it be not ſo, ſince ſtones in the kidneys cauſe Colics. Commonly, and perhaps properly, the ſtimulus of Diuretics is ſuppoſed of a ſaline nature; but I would by no means confine it to this. Any Acrid will do, and there is Acrimony of an oily kind, and others with which we are not acquainted.

As to their general effects:

1. They evacuate water from the blood-veſſels, and by the evacuation cauſing an abſorption, water accumulated in any quantity and ſtagnating in the cavities. Hence they are ſuppoſed to cure Dropſy, but their ſtimulus is generally but gentle, and we ſucceed leſs often than we would wiſh or imagine.

2. They evacuate with the water, the ſaline, putreſcent parts of our blood, and hence all Diuretics are antiſcorbutic; and the contrary.

3. With theſe Diuretics waſh out all the extraneous bodies in the ſeroſity. Hence they may be uſeful in evacuating every ſort of Acrimony.

If their operation were certain, this claſs of medicines would be of infinite advantage; nay, they may often be ſo without any ſenſible effect, for every Diuretic is a Diaphoretic. In order to expede their operation, it is always proper to throw in much water, which

which may run off by the ſerous excretories. The only exception to this is the caſe of Dropſy, but even here we are not certain. We have had lately an inſtance, in this place, of a woman labouring under an Anaſarca, and ſeemingly an Aſcites, which has reſiſted every medicine, who, by drinking largely of a mineral water, brought on a great flow of water, and was relieved. There are inſtances in phyſic of a cure performed by common water, but ſtill the caſe is doubtful.

PARTICULAR DIURETICS.

Of the vegetable Diuretics I have marked two natural orders.

1. The *Umbellatæ*, which have univerſally a diuretic power aſcribed to them. Their effects are never very evident, although, like the Cicuta, they may be uſeful without theſe being ſenſible. I have ſet down ſuch as are moſt employed, but cannot ſay how far the choice is accurate.

2. *Stellatæ*. The whole of this claſs are aſtringent, and it is to this property that their diuretic virtue, if ever they exert it, is, I imagine, to be imputed. Although theſe are the only natural orders particularized, yet under the title *Stimulantia*, referred to, will be found the *Siliquoſæ*, *&c.* with which I might have encreaſed the liſt, as every one of them is famous in this way.

What follow next are a *Miſcellaneous Set*, put together from various ſources, upon very uncertain foundation, except with regard to a few.

Aſarum, *Geniſta*, and *Seneka*, are mentioned, to ſhow that all Emetics and Cathartics, by proper management, may be rendered diuretic. Thus Ipecacuan, by ſtrong coction, will loſe its emetic, but reſerve a diuretic power.

Abſynthium, *Carduus*, *Ruta*, &c. are all, on many occaſions, evidently diuretic, but without any pretenſions to ſaline acrimony.

With regard to the reſt, hardly any particular marks need be made.

Dulca-

Dulcamara is a ſpecies of Solanum, and of the nature of it and the other *Luridæ*. Its berries are narcotic, which the leaves and bark are, in a leſs degree, with the addition of a purgative virtue. The woody parts are leaſt narcotic, ſomewhat purgative, and more diuretic. The uſe of this has lately been reſtored by Linnæus, who gave ℥ij. of the *Stipites* in decoction, which he and his compatriots recommend as a cleanſer of every acrimony in the blood.

Saline Diuretics. The increaſe of urine is never very remarkable from theſe, except when the ſalt is accompanied with a large quantity of water, to which the increaſe may be greatly imputed. The moſt powerful of the Saline Diuretics is the Cauſtic Alkali mitigated with Acids, and perhaps more effectual when joined to the Bitters, the virtues of the one mutually encreaſing, and being encreaſed by, the virtues of the other.

DIAPHORETICS.

Theſe are properly of two kinds; 1. Thoſe ſtrictly ſo called, which promote inſenſible perſpiration only; 2. Thoſe which cauſe ſweat. Of the Diaphoretics, ſtrictly ſo called, as the effect is not evident to the ſenſes, and ſeldom tried by ſtatical experiments, our knowledge is not accurate. We have only account of one by Santorius, *viz.* Aſſa Fœtida.

As to their general effects, they are analagous to thoſe of Diuretics. Sudorifics act thus ſenſibly, and ſo have been employed in Dropſy, but their uſe is uncertain, as the means employed to obtain their operation excite a fever, which is not always ſafe. They eſpecially evacuate every putreſcent part of the blood, every acrimony generated there, and every extraneous matter. We are more certain of this operation, by making external aſſiſtants concur without internal Diaphoretics. Here we ſhould ſuppoſe, as the action is more extended, that a more copious evacuation is made, and more convenient, as we can in ſome meaſure ſecure it, when theſe means are not hurtful with regard to the diſeaſe we could cure. In the Scurvy, Sweating would be hurtful, and a Diaphoreſis is only proper. In the *Lues Venerea* Sweating has peculiar advan-

tages. It can be kept up more ſteadily than the evacuation by ſtool, and more conveniently than ſalivation, and if it could be excited with eaſe, is certainly the beſt method of cure. Sweat is the only excretion, which, independent of particular ſtimulus, merely follows the increaſe of circulation, which connection ſeems to have been eſtabliſhed by Nature, in order to obviate the effects which would ariſe from heat, motion, &c. and hence Sweating might cure Fever, without having recourſe to the evacuation of any particular matter. Fever is always found in a conſtriction of the ſurface of the body, and if this be granted, it is plain the relaxation of the conſtriction may take it off. Hence there is no doubt but Sweating may cure Fever, but whether at all times it is proper, I will not ſay. It is alledged, that if we can bring out a Sweat in the beginning, we may obviate any Fever; but this needs confirmation, and I do not agree to it. Certain, however, it is, that the caſe is often thus. Some are of opinion, that Sweating may be uſed during the whole courſe of a Fever, while others think it ought only to be employed in the beginning. This diſcuſſion we cannot enter upon at preſent. To determine when and where they ſhould be exhibited is very difficult, but it muſt be admitted, that in many caſes Sudorifics are uſeful.

Sudorific power and ſudorific medicines are of different kinds. All general Stimulants of the ſyſtem, as motion and heat, are powerful Sudorifics. The laſt ſeems to concur with the others I am to mention. Particular Stimulants may be of two kinds; 1. Thoſe which are applied to the excretories themſelves; 2. Thoſe applied to parts conſenting with them, as the ſtomach and inteſtines.

In the next place, Sudorifics may be Antiſpaſmodics. Theſe are of two kinds; 1. The Sedative and Narcotic; 2. The Antiſpaſmodics, ſtrictly ſo called. The firſt relax the ſmaller, and give a ſtimulus to the larger veſſels. The ſecond are ſuch as we are not certain by what power they act.

With regard to all of them, we had occaſion to mention them before. We have only one thing to obſerve. Stimulant Sudorifics

rifics are only to be employed as Evacuants, when there is no feveriſh Spaſm, except to obviate the Spaſm at an intermiſſion, or when the antiſpaſmodic virtue is in conſiderable proportion, becauſe febrile Spaſm is not to be overcome, but aggravated, by increaſing the circulation. This eſpecially takes place with regard to inflammatory Spaſm. In order, therefore, to proceed ſafely, we muſt uſe Antiſpaſmodics. Whether or not theſe are ſo with regard to inflammatory Spaſm, as is alledged of Camphire, I ſhall not determine, but undoubtedly this, Muſk, *&c.* are uſeful in the feveriſh Spaſm, and where Nature points out a remiſſion and acceſſion, and then may ſafely be employed.

MENAGOGA.

In concluding our laſt head, we were engaged in a difficult ſubject, and at preſent we enter upon one of the ſame nature, in the conſideration of Emmenagogues, for there is not an indication which we have leſs in our power. It differs in this from the other evacuations, that we never think of encreaſing it above its natural quantity, or of applying medicines but to overcome its obſtruction. Hence, medicines on this head muſt differ as the cauſe of obſtruction differs. 1. Nothing has been more common than to ſuppoſe the menſtrual flux depending on an univerſal plethora, ſo that a defect of it muſt depend on a defect of fluids, and whatever reſtores the plethora muſt reſtore this. But in my opinion this cannot be the caſe, for the flux often goes on ſteadily and regularly where this defect of fluids in the ſyſtem takes place. 2. A certain lentor and viſcidity of the blood has been reckoned a cauſe of the menſtrual flux. Againſt this I would alledge, that the preſence of ſuch an actual lentor has never been proved, and although it had, it is very unlikely that it ſhould ever affect the lax dilatable ſyſtem of uterine veſſels. 3. With more probability has a defect of motion, as it is often apt to occur in the weak, as in the caſe of Chloroſis, and where there is a weak ſyſtem of the uterus. But ſtill there is an uncertainty here, and it is doubtful of the weakneſs and obſtruction, whether is cauſe or effect. To remove the diſeaſe, however, it is neceſſary to

remove the flaccidity. 4. But the moſt obvious cauſe is the conſtriction of the extreme veſſels, the *contractio vaſi propria aucta*, which is often produced by cold, paſſions of the mind, &c. for ſuppoſe we ſhould admit the weaker impetus, it could not have the effect, unleſs as it gives an opportunity for a ſtrong ſtricture in the extremities. Hence Menagogues may be conſidered as of three kinds.

1. Aſtringents, in ſo far as they can be employed to reſtore the tone of the ſyſtem, *i. e.* ſuch as produced a conſtriction, which does not go ſo far as a ſpaſmodic affection, but increaſes the impetus of the ſyſtem. Almoſt all of theſe have been, at different times, employed. I have only ſet down Iron as moſt commonly in uſe. Probably, by introducing it in ſmall quantities, and at intervals, it might be made to act as a tonic. The aſtringent Bitters, as the Bark, might be employed for the ſame purpoſe.

2. Menagogues may be Stimulants, of which there are of different kinds. 1. Such as act on the ſyſtem more generally, and only indirectly encreaſe the impetus of the blood in the uterus, as externally the Cold Bath, and internally Mercury, which produces briſker oſcillations in the extreme veſſels of the whole ſyſtem. 2. Stimulants may be ſuch as act on the uterus itſelf. Theſe have been ſuppoſed ſuch as act ſpecifically upon the uterus. Specific ſtimuli to the ſecretions can be explained, but ſuch explication cannot be given here; and I would alledge, that none ſuch are yet ſhown, and that the direct ſtimulants of the uterus are only the external. There is no doubt but application might be made to the uterus by way of fotus, but this is not ſo convenient, and could only be in common to it with the whole lower belly. Injection into the vagina has been propoſed, but this can ſeldom be admitted; caſes, however, have been alledged of its ſucceſs. The injection of the ſmoke of tobacco has been propoſed, and I make no doubt of the exertion of its ſtimulus: Such medicines alſo as aloes and the fœtid gums (of which, though difficult to explain, the virtue in ſome meaſure ſeems to be proved, of a ſpecific power of encreaſing hæmorrhagy,) may be employed. 3. There is another way ſtill of uſing Stimulants, *viz.* by determining the blood in greater quantity

to

to the deſcending aorta and its branches, and ſo to the uterus. Such is the application of warm water to the extremities, and opening the veins of the foot, which laſt is an evacuation certainly of little conſequence in encreaſing the impetus indirectly, and is not ſenſible on a calculation. Purging is a more effectual derivation, as the ſtimulus ſubſiſts ſome time, as the evacuation that way may be greater than any other, and as the ſtimulus even may be communicated from the conſent between the womb and alimentary canal: Hence acrid purgatives are often effectual Menagogues. The ſame thing is effected by ſuch medicines as have a particular power of ſtimulating the urinary paſſages, as Cantharides, which excite the venereal appetite, which cannot be done without a conſiderable determination of the blood to the genital parts, and to the uterus in particular. On this account I doubt not but that ſuch, if they could be ſafely employed, would prove menagogue.

3. Antiſpaſmodics may be menagogue, as the diſeaſe is founded in ſpaſmodic conſtriction. Thoſe of the fœtid kind are ſuppoſed to be peculiarly appropriated, but the others would anſwer equally well, if we had the proper method of applying them, which, as there is a continued ſpaſm, we ſhould ſuppoſe might be done at all times; but, on repeated experience, I have found they are only uſeful in the time of the menſtrual period.

None of the medicines proper for the removal of the menſtrual obſtruction can be employed at all times, and when the period is not eſtabliſhed, except the Aſtringents and Mercury; but it is only at the return of the menſtrual period, where there is an aggravation of the ſymptoms, and an effort of nature, that the Stimulants, and more eſpecially the Antiſpaſmodics, can be effectual. I have no doubt that Muſk may be a powerful remedy, when given at the time of the paroxyſm, or aggravation. Caſtor is ſet down as a general title for the fœtid Antiſpaſmodics. Crocus is very ſeldom to be depended upon.

CATA-

CATALOGUS MATERIÆ MEDICÆ.

MEDICAMENTA agunt in

- Solida
  - Simplicia
    - NUTRIENTIA I.
    - ADSTRINGENTIA II.
    - EMOLLIENTIA III.
  - Viva
    - STIMULANTIA IV.
    - SEDATIVA V.
    - ANTISPASMODICA VI.
- Fluida
  - *Alterantia*
    - ATTENUANTIA VII.
    - INSPISSANTIA VIII.
    - DEMULCENTIA IX.
    - ANTACIDA X.
    - ANTALKALINA XI.
    - ANTISEPTICA XII.
  - *Evacuantia*
    - ERRHINA XIII.
    - SIALAGOGA XIV.
    - EXPECTORANTIA XV.
    - EMETICA XVI.
    - CATHARTICA XVII.
    - DIURETICA XVIII.
    - DIAPHORETICA XIX.
    - MENAGOGA XX.

I. NUTRIENTIA.

1. Ex VEGETABILIBUS.

a. *Fructus acido-dulces.*

Drupaceæ.

Ceraſa.
Mala Armeniaca.
Mala Perſica.
Pruna.

Pomaceæ.

Mala Hortenſia.
Pyra.

Heſperideæ.

Aurantia.

Senticoſæ.

Fraga.
Rubi Idæi fructus.

Uvæ Vitis.
Ribeſia.
Uvæ criſpæ.

Fructus ſiccatæ.

Uvæ paſſæ.
Dactyli.
Ficus.

b. *Cucurbitaceæ.*

Cucumeres.
Melones.
Pepones.

c. *Herbæ*

c. *Herbæ—Oleraceæ.*
Atriplex
Beta.
Spinacia.

Lactuca Agnina.
Siliquoſæ.
Braſſica.
Naſturtium.
Semifloſculoſæ.
Cichorium.
Dens Leonis.
Endivia.
Lactuca.
Umbellatæ.
Celeri.

Aſparagus.
Capitatæ.
Cinara.

d.
Fungi.

e. *Radices.*
Raphanus.
Rapum.
Umbellatæ.
Daucus.
Paſtinaca.
Siſarum.
Semifloſculoſæ.
Scorzonera.
Tragopogon.

Battatas.
Alliaceæ.
Porrum.
Cepa.
Allium.

f. *Semina.*
Avena.
Hordeum.
Secale.
Milium.
Triticum.
Oryza.
Mayz.

Fagopyrum.
Medulla farinoſa.
Sago.
Radix farinoſa.
Salep.

Legumina.
Piſa.
Fabæ.
Phaſeoli.
Nuces oleoſæ.
Amygdalæ dulces.
Avellana.
Cacao.
Caſtanea.
Juglans.
Piſtacia.

g. *Sepiariæ.*
Olivæ.

h. *Fermentati potus.*
Cereviſia.
Vinum.

i. *Condimenta & condita.*
Aromata.
Saccharo, Sale, vel Aceto condita.

2. Ex ANIMALIBUS.

a. Lac Fœminæ.
Aſinæ.
Equæ.
Vaccæ.
Ovis.
Capræ.

b. *Quadrupeda.*
Bos.
Ovis.
Caper.
Cervus.
Glires.
Lepus.
Beſtiæ.
Sus.

c. *Aves—Gallinæ.*
Gallus Gallinaceus.
Meleagris Gallopavo.
Pavo Criſtatus.
Tetrao Perdix.
Coturnix.
Lagopus.
Tetrix.
Urogallus.
Anſeres.
Anas domeſtica.
moſchata.
Boſchus major.
Querquedula.

Anſer

Anſer domeſticus.
ferus.
Cygnus.
Pelecanus Baſſanus.
Alca torda.
Grallæ.
Ardea.
Scolopax.
Tringa.
Charadrius.
Hæmatopus.
Fulica.
Rallus.
Otis.
Paſſeres.
Columba.
Alauda.
Turdus.
Emberiza.

d. *Piſces.*

Salmo Salar.
trutta.
hucho.
alpinus.
eperlanus.
thymallus.
Cyprinus barbus.
carpio.
gobio.
tinca.
cæphalus.
rutilus.
alburnus.
brama.
Perca fluviatilis.
Gadus æglefinus.
merlangus.
morhua.
molva.
virens.
callarias.
Cyclopterus lumpus.
Scomber ſcombrus.
thynnus.
Trigla cuculus.
Mugil.
Eſox lucius.
Clupea harengus.
ſprattus.
encraſicolus.
aloſa.
Pleuronectus fleſus.
Pleuronectus ſolea.
plateſſa.
maximus.
hippogloſſus.
Ammodytes.
Muræna anguilla.
conger.
Anarrhichas.
Amphibia nantia.
Petromyzon.
Raia batis.
Accipenſer Sturio.

e. *Inſecta.*

Cancer pagurus.
gammarus.
ſquilla.

f. *Vermes.*

Sepia loligo.
Teſtaceæ.
Patella vulgata.
Helix pomatia.
Buccinum undatum.
Turbo littoreus.
Solen Siliqua.
Cardium edule.
echinatum.
Venus Chione.
Oſtrea maxima.
edulis.
Mytulus edulis.

Volucrum Ova.

II. ADSTRINGENTIA.

1. Ex FOSSILIBUS.

Terræ.
Bolus.
Cimolia.
Oſteocolla.
Aluminoſa.
Alumen.
Lapis Hibernicus.
Metallicæ, ex Cupro.
Cuprum.
Ærugo.
Vitriolum cæruleum.
Ex Ferro.
Ferrum.
Hæmatites.

Rubrica fabrilis.
Vitriolum viride.
Ex Plumbo.
Plumbum.
Ceruſſa.
Lithargyrus.
Minium.
Ex Zinco,
Zincum.
Calaminaris Lapis.
Tutia.
Vitriolum Album.

2. Ex VEGETABILIBUS.

a. *Senticoſæ.*
Agrimonia.
Alchimilla.
Argentina.
Caryophyllata.
Fragaria.
Quinquefolium.
Roſa.
Tormentilla.
b. *Stellatæ.*
Aparine.
Gallium.
Rubia.
c. *Vaginales.*
Acetoſa.
Hydrolapathum.
Oxylapathum.
Biſtorta.
Rheum.
d. *Filices.*
Filix florida.
Lingua cervina,
Trichomanes.
Muſci.
Muſcus.
e. *Acerba.*
Cydonea mala.
Meſpila.
Mora.
Pruna Sylveſtria.
Sorba.
f. *Variæ.*
Anchuſa.
Balauſtia.
Brunella.
Hypericum.
Lythrum.
Millefolium.
Myrtus.
Plantago.
Polygonatum.
Sanicula.
Sedum.
Viſcus Quernus.
Urtica.
Uva Urſi.
Succi inſpiſſati.
Acacia.
Catechu.
Hypociſtis.
Sanguis Draconis.
Cortices.
Cortex Granatorum.
Fraxini.
Quercus.
Simaroubæ.

Lignum Campechenſe.

Gallæ.

3. *Acida* I. 1. a. XI. 1. 2.
Vina Auſtera.
Amara IV. i.
Sedativa.
Balſamica IV. f.

III. EMOLLIENTIA.

1. Aqua et aquoſa blanda.

2. Ex VEGETABILIBUS.

a. *Columniferæ.*
Althæa.
Malva.
b. *Farinoſa et Mucilaginoſa.*
Sem. Cannabis.
Cydoniorum.
Fœnugræci.
Lini.
Pſyllii.
c. *Oleraceæ.*
Atriplex.
Beta.
Bonus Henricus.
Spinacia.

d. *Variæ.*
Alsine.
Branca ursina.
Melilotus.
Parietaria.
Saponaria.
Verbascum.
Rad. Liliorum alborum.
Cepæ coctæ.
e. *Oleosa.*
Olea pressa blanda.

3. Ex ANIMALIBUS.

Lac.
Butyrum.
Adeps.
Axungia.
Sperma Ceti dictum.

IV. STIMULANTIA.

1. Ex VEGETABILIBUS.

a. *Verticillatæ. Cephalica.*
Betonica.
Lavendula.
Stæchas Arabica.
Melissa.
Calamintha.
Majorana.
Marum Vulgare.
Origanum.
Dictamnus Creticus.
Rosmarinus.
Pectoralia.
Hyssopus.
Hedera terrestris.
Pulegium.
Stomachica.
Mentha sativa.
piperitis.
Nepeta.
Cardiaca.
Marum Syriacum.
Satureia.
Serpyllum.
Thymus.
Alexipharmica.
Salvia.
Chamædrys.
Scordium.

b. *Umbellatæ.*
Ammi.
Amomum.
Anethum.
Angelica.
Anisum.
Carum.
Coriandrum.
Cuminum.
Daucus Creticus.
Fœniculum.
Hipposelinum.
Levisticum.
Pimpinella Saxifraga.
Seseli Massilienſe.
Siler Montanum.
c. *Siliquosæ.*
Alliaria.
Cochlearia.
Eruca.
Erysimum.
Lepidium.
Nasturtium.
Napum.
Raphanus rusticanus.
Sinapi.
Thlaspi.
d. *Alliaceæ.*
Allium.
Cepa.
Porrum.
e. *Coniferæ.*
Abies.
Pinus.
Juniperus.
f. *Balsamica.*
Terebinthina.
Bals. Copaibæ.
Gileadenſe.
Peruvianum.
Tolutanum.
Gum. Guaiacum.
Myrrha.
Styrax Liquida.
g. *Sudorifica—Ligna.*
Guaiacum.
Sassafras.
Santalum.
Radices.
China.
Contrayerva.
Sarsaparilla.

h. *Aromatica fragrantiora.*
Cinnamomum.
Caſſia lignea.
Macis.
Nux moſchata.
Caryophylli.
Pimento.
Minus fragrantia.
Canella alba.
Cort. Winteranus.
Zinziber.
Acriora.
Piper.
Capſicum.
Debiliora.
Cubebæ.
Cardamomum minus.
Grana Paradiſi.
Ingratiora.
Galanga.
Zedoaria.
Serpentaria Virg.
Debiliſſima.
Balſamita.
Coſtus orientalis.
Ginſeng.
Lilium convallium.
Malabathrum.
Nardus Celtica.
Indica.
Caſcarilla.
Ligna.
Aſpalathus.
Rhodium.
Gummi.
Benzoinum.
Labdanum.
Styrax calamita.

i. *Amara calida.*
Abrotanum fœmina.
mas.
Abſinthium Romanum.
vulgare.
Artemiſia.
Carduus benedictus.
Carlina.
Chamemælum.
Santonicum.
Tanacetum.
Aurantiorum Cortex.
Aurantia Curaſſavenſia.
Limoniorum Cortex.

Centaurium minus.
Gentiana.

China Chinæ.
Acorus verus.
Chamæpitys.
Marrubium album.
Dictamnus albus.
Lupulus.
Trifolium paluſtre.

k. *Amara frigida.*
Cichorium.
Dens Leonis.
Endivia.
Lactuca.

Fumaria.

l. *Acria.*
Arum.
Euphorbium.
Imperatoria.
Iris noſtras.
Perſicaria urens.
Pyrethrum.
Sedum minus acre.
Staphiſagria.

m.
Vinum.

n.
Olea eſſentialia.

3. Ex ANIMALIBUS.

Cantharides.
Millepedæ.
Cochinillæ.

4. *Nutrientia.*
Adſtringentia.
Sedativa.
Antiſpaſmodica.
Acida I. 1. a. XI. 1. 2.
Alkalina X. b.
Sales neutri.

V. SEDATIVA.

1. *Strictius dicta.*
   a. *Rhœades.*
      Papaver.
   b. *Umbellatæ.*
      Cicuta.
      Cicuta aquatica.
   c. *Luridæ.*
      Belladonna.
      Hyoscyamus.
      Mandragora.
      Nicotiana.
      Solanum.
      Stramonium.
   d. *Variæ.*
      Lactuca.
      Laurus.
      Coffea.
      Thea.
      Crocus.
      Nymphæa.
   e. *Spirituosæ.*
      Vinum.
      Alcohol.

2. *Acida* I. 1. a. XI. 1. 2.
   Sales neutri.
   Emollientia.
   Adstringentia.
   Antispasmodica.

VI. ANTISPASMODICA.

1. Ex FOSSILIBUS.

Ambragrisea.
Succinum.
Petroleum.

2. Ex VEGETABILIBUS.

a. *Herbæ fœtidæ.*
   Aristolochia.
   Artemisia.
   Atriplex olida.
   Cardiaca.
   Cuminum.
   Levisticum.
   Meum.
   Matricaria.
   Pulegium.
   Ruta.
   Sabina.
b. *Gummi fœtida.*
   Asa fœtida.
   Ammoniacum.
   Galbanum.
   Opopanax.
   Sagapenum.
   Tacamahaca.
c.
   Camphora.
d. *Radices graveolentes.*
   Cassumuniar.
   Pæonia.
   Valeriana sylvestris.
e.
   Fuligo ligni.
f.
   Olea essentialia.
   empyreumatica.
g.
   Alcohol.
   Liquor Æthereus.

3. Ex ANIMALIBUS.

Moschus.
Zibethum.

Castoreum.

Sales alkalini volatiles.
Olea empyreumatica.

4. *Adstringentia.*
   Emollientia.
   Demulcentia.
   Stimulantia.
   Sedativa.

VII. ATTENUANTIA.

Aqua.
Alkalina X. b.
Sales neutri.
Sapones.
Dulcia IX. c.
Nutrientia 1. a. b. c. d.
Emollientia 2. c. d.

VIII. INSPISSANTIA.

Acida XI. 2.
Alcohol.
Nutrientia 1. e. f. 2. b. &c.
Adſtringentia.
Demulcentia a. b. d.

IX. DEMULCENTIA.

a. *Aſperifoliæ.*
Conſolida major.
Cynogloſſum.
Pulmonaria.
b. *Farinoſa.*
Sem. Cucurbitæ.
Citrulli.
Cucumeris.
Melonis.
Papaveris.
c. *Dulcia.*
Saccharum.
Mel.
Uvæ paſſæ.
Dactyli.
Ficus.
Cynoſbatos.
Glycyrrhiza.
d. *Mucilaginoſa.*
Gum. Arabicum.
Ceraſorum.
Senega.
Tragacantha.
Amylum.
Ichthyocolla.
e.
Nutrientia.
Emollientia.
Sedativa.

X. ANTACIDA.

a. *Foſſilia.*
Calcarius lapis.
Creta.
Oſteocolla.
Animalia plerumque teſtacea.
Cancrorum chelæ.
oculi dicti.
Cervi Cornu uſtum.
Corallina.
Corallium rubrum.
Lapis Bezoar orientalis.
Margaritæ.
Ovorum teſtæ.
Oſtreorum teſtæ.
Sepiæ os.
b. *Sales alkalini.*
Alkali fixum vegetabile.
foſſile.
Calx viva.
Alkali volatile.
c. *Neutra.*
Borax.
Tartarus ſolubilis.
Sapo.
d.
Stimulantia.
Sedativa.
Antiſpaſmodica.
Demulcentia.

XI. ANTALKALINA.

1. *Acida nativa.*
Acetoſa.
Acetoſella.
Berberis.
Ribeſia.
Tamarindi.
Succus Aurantiorum.
Limoniorum.
2. *Acida arte parata.*
Vinum.
Acidum vegetabile.
muriaticum.
nitroſum.
vitriolicum.
Sal Sedativum.
Succini.
3. *Nutrientia* a. b. c. d. e. g.
Adſtringentia 2. c.
Demulcentia.

XII. ANTI-

XII. ANTISEPTICA.

Acida I. a. II. c. XI. 1. 2.
Alkalina X. b.
Sales neutri.
metallici.
terreſtres.
Olea eſſentialia.
empyreumatica.
Vinum.
Alcohol.
Nutrientia 1.
Adſtringentia.
Stimulantia.
Sedativa.
Antiſpaſmodica.

XIII. ERRHINA.

Mitiora.
Beta.
Betonica.
Majorana.
Acriora.
Aſarum.
Euphorbium.
Helleborus albus.
Iris noſtras.
Nicotiana.
Ptarmica.
Pyrethrum.
Foſſilia.
Turbith minerale.

XIV. SIALAGOGA.

Stimulantia externa.
Angelica.
Caryophylli.
Imperatoria.
Nicotiana.
Piper.
Pyrethrum.
Stimulantia interna.
Hydrargyrus.

XV. EXPECTORANTIA.

Hedera terreſtris.
Hyſſopus.
Marrubium.
Pulegium.
Enula campana.
Iris Florentina.
Nicotiana.
Scilla.
Petaſites.
Tuſſilago.
Benzoinum.
Styrax calamita.
Pix liquida.
Sapo.
Stimulantia b. c. d. f.
Antiſpaſmodica 2. b.
Demulcentia c.

XVI. EMETICA.

1. Ex FOSSILIBUS.

Cuprum.
Hydrargyrus.
Antimonium.
Zincum.

2. Ex VEGETABILIBUS.

Aſarum.
Erigerum.
Ipecacuanha.
Nicotiana.
Scilla.
Sinapi.
Raphanus ruſticanus.
Amara IV. i.
Cathartica.

XVII. CA-

XVII. CATHARTICA.

Acescentia.
Fructus acido-dulces I. 1. β.
Pruna Brignolensia.
Gallica.
Cassia fistularis.
Tamarindi.
Dulcia.
Saccharum.
Mel.
Manna.

Aqua.
Serum Lactis.
Lac ebutyratum.

Olera blanda I. 1. c. d.

Olea blanda ex Vegetabilibus et Animalibus.
Sapo albus Hispanus.
Rosæ Damascenæ.
Viola.
Polypodium.
Sinapi.

Sulphur.

Amara IV. i. k. VI. 1. a.
Bilis Animalium.
Balsamica IV. f.
Salina.
Tartarus.
Alkalina fixa.
Sales neutri.
Magnesia alba.
Acriora.
Antispasmodica 2. b.
Aloe.
Agaricus.
Rhabarbarum.
Seneka.
Genista.
Senna.
Helleborus niger.
Mechoacanna.
Turpethum.
Jalapium.
Scammonium.
Soldanella.
Arthanita.
Ebulus.
Sambucus.
Rhamni baccæ.
Frangulæ cortex.
Linum Catharticum.
Chelidonium majus.
Gambogia.
Mercurialis.
Ricinus.
Gratiola.
Nicotiana.
Helleborus albus.
Colocynthis.
Cucumis asininus.
Elaterium.
Metallica.
Aurum.
Argentum.
Hydrargyrus.
Antimonium.

Emetica.

XVIII. DIURETICA.

a. *Umbellatæ.*
Apium.
Petroselinum.
Chærefolium.
Daucus Sylvestris.
Fœniculum.
Meum.
Pimpinella Saxifraga.
Siler montanum.
Eryngium.
b. *Stellatæ.*
Aparine.
Asperula.
Rubia.
c. *Variæ.*
Alkekengi.
Arnica.
Arum.
Asarum.
Asparagus.
Absinthium.
Carduus benedictus.
Bardana.
Dulcamara.
Enula.

Genista,

Geniſta.
Gramen.
Linaria.
Lithoſpermum.
Ononis.
Pareira brava.
Perſicaria urens.
Ruta.
Sabina.
Saxifraga alba.
Seneka.
Scilla.

d.

Acida I. 1. a. XI. 1. 2.
Alkalina X. b.
Sales neutri.
Antacida a.
Sal Ammoniacum fixum.
Sapo.
Olera I. 1. c. e.
Emollientia 1. 2. c. d.
Stimulantia 1. b. c. d. e. f. k. 2.

XIX. DIAPHORETICA.

Vegetabilia.
Angelica.
Calendula.
Crocus.
Dulcamara.
Opium.
Ambragriſea.
Moſchus.
Zibethum.
Camphora.
China.
Contrayerva.
Serpentaria Virg.
Guaiacum.
Saſſafras.
Sarſaparilla.
Seneka.
Salvia.
Scordium.
Metallica.
Antimonium.
Hydrargyrus.

Aqua.
Vinum.
Acida vegetabilia.
Alkali volatile.
Sales neutri.
Olea Eſſentialia.
Empyreumatica.
Stimulantia.
Sedativa.
Antiſpaſmodica.
Antacida a.
Emetica.
Cathartica.
Diuretica.

XX. MENAGOGA.

Aloe.
Caſtoreum.
Crocus.
Ferrum.
Hydrargyrus.
Stimulantia.
Antiſpaſmodica. 1. 2. a. b.
Emetica.
Cathartica.
Diuretica.

Some ſubſtances mentioned in the Catalogue are not to be found in the Index, as not being particularly treated of; but their qualities will be underſtood by looking in the Index for the general title, claſs, or order under which each ſubſtance ſtands arranged in the Catalogue. Thus the *Alchimilla* is not mentioned particularly in the Index, but its general qualities will be underſtood by thoſe of the *Senticoſæ*, which is to be found in the Index, and is the order to which it belongs.

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FINIS.

Page 11. line 5. *For* Hence plethora *&c. to the end of the paragraph, read* Obesity may cause plethora; as in obesity, though a greater quantity is secreted, it is not let off from the body, and may therefore press upon the vessels and cause plethora.

l. 17. *For* viz. *read* besides those of.

l. 22. *For* of these proportions, *read* and proportions of these.

l. 25. *For* as their less or greater florid colour, *read* as the less or more florid colour of the whole.

P. 12. l. 4. *For* pure principle, *read* to the abundance of a pure watery part, as saline matter may, &c.

l. 27. *After* arterious coats, *add* in proportion to those of the veins.

l. 28. *For* people, *read* animals.

P. 13. l. 17. *For the whole of this and the following paragraph, to* produced, *p.* 14. *l.* 3. a fine, *read*

5. *Different state of the nervous power* with regard to sensibility, irritability, mobility, and strength. By sensibility we mean the fitness for having sensation excited by external impression; and as different forces of impression are necessary to move different persons, the sensibility is greater, as the less force of impression is necessary to sensation. By irritability, we mean the fitness for having motions excited in consequence of sensation, or other causes; and this appears different, not only with respect to the degree of force in the cause, but with respect to the extent of the effects in the system. Thus, of two persons, not only one will be vomited by a much smaller quantity of an emetic than the other, but also two persons taking the same dose will be very differently affected, while, in the one, the effects will be confined to the stomach, and the parts necessarily connected with it in vomiting, and, in the other, the effects will be extended so as to produce convulsions over the whole body. Of the difference of

ſenſibility we are able to judge but groſsly, as it does not always depend on the degree of force in impreſſion, but in this reſpect is greatly changeable by cuſtom and practice. This is particularly to be obſerved, that there is a great difference between the ſenſibility to a ſingle impreſſion, and the ſenſibility to the difference of force in the ſame ſpecies of impreſſions, or to the difference of impreſſions nearly akin to one another. Thus, there may be two perſons equally ſenſible to the ſmalleſt impreſſions of any ſapid body on the tongue; but, while the one may be able to diſtinguiſh only green from bohea tea in infuſion, and hardly any difference in the qualities of each, the other ſhall be able to diſtinguiſh not only many different degrees in the qualities of either ſpecies, but alſo, in the caſe of their mixture, be able to diſcern the proportion in which they are mixed together. The ſame difference of ſenſibility occurs more frequently ſtill with reſpect to ſound. A perſon may be exquiſitely ſenſible to the ſoft-eſt impreſſion of ſound, but, at the ſame time, may be very little ſenſible to any difference of tones. Irritability muſt commonly be connected with ſenſibility; for, as motion depends upon ſenſation, that, therefore, will be generally in proportion to this: But they are not abſolutely connected; for, independent of the nervous power in the brain, the ſubject of ſenſations, irritability is often varied by the greater or leſſer tenſion, and perhaps other circumſtances, of the moving fibres themſelves. Both ſenſibility and irritability are often connected with the weakneſs of the nervous power, never remarkably with its ſtrength.

Another particular in which the ſtate of the nervous power may be different, is mobility, that is, the facility and readineſs with which not only motions are in gene-

ral

ral excited, but eſpecially that alſo with which different motions ſucceed one another. In the firſt reſpect, mobility is the ſame with irritability; but, in the laſt, it is ſomewhat different. It is obvious, that the nervous power or ſenſorium, is more tenacious of impreſſions in one perſon than in another; and the change, therefore, from one motion to another, will, in ſuch perſons, be in the ſame proportion; which amounts to this, that there is a difference of mobility in the nervous power of different perſons. However, we obſerve that this mobility is commonly greateſt in the moſt ſenſible and irritable ſyſtems. Laſtly, The nervous power, or energy of the brain, differs greatly in point of ſtrength. Some have ſuppoſed that the ſtrength of the body depended upon the ſtrength of the ſimple ſolids; and I allow that it is often connected with this. But, as the ſtate of the ſimple ſolids cannot be ſuddenly changed, thoſe changes of debility and ſtrength which are ſudden and tranſitory, muſt be owing to changes in the ſtate of the nervous power. Thus, at the invaſion of fevers, we obſerve a conſiderable debility take place, more ſuddenly than we can ſuppoſe any change to be made in the ſtate of the ſimple ſolids. Again, in maniacal perſons, there is often an incredible increaſe of ſtrength, which we cannot ſuppoſe to proceed from an increaſed rigidity of the ſimple ſolids ſo ſuddenly produced. This ſtrength, &c.

Page 15. line 21. *After* blood *add* veſſels.

P. 16. l. 13. *For* haemoptoiſis, *read* haemoptyſis.

l. ead. *Dele* peripneumony.

l. 27. *After* ſecretion, *add* of oil.

P. 20. l. 9. *For* E. g. 1. *read* to this purpoſe obſerve, 1. That.

l. 11. *Dele* 2. *and what follows, to* cauſes, l. 16.

l. 19. *For* ſo, *read* produced.

l. 22. *Dele* and particularly irritability.

Page 20. l. 24. *For* that, *read* their.

P. 22. l. 22. *For* This, *read* The neceſſity of a certain degree of tenſion.

P. 23. l. 1. *For* Repetition, &c. *to* accurate, *l.* 3. *read* Repetition diminiſhes ſenſibility, and if, upon occaſion, it ſeems to increaſe it, it is only in ſo far as it renders perception of the different degrees of impreſſion more accurate.

l. 21. *For* a ſtrong emetic, *read* frequent emetics.

P. 26. l. 3. *For* flexion, *read* extenſion.

P. 27. l. 1. *For* this, &c. *to* ſteadineſs, *l.* 4. *read* All this is aſſiſted, not only by the influx into the ſeveral muſcles becoming more free, but alſo by frequent repetition, as it is only by ſuch experience that we learn the moſt proper attitude and concurrence of muſcles for performing any action with facility and ſteadineſs.

P. 27. l. 7. *Dele* Thus, &c. *to* effect, *l.* 10.

P. 29. l. 15. *For* did *read* does.

P. 31. l. ult. *For* is the rule, &c. *to* health, *p.* 32. *l.* 2. *read* is declaring the change to be made in the ſtate of the body neceſſary for changing a diſeaſed ſtate to that of health.

P. 32. l. 22. *For* for, *read* inſtead of.

P. 39. l. ult. *For* diſſolves, *read* reſolves.

P. 49. l. 1. *After* food, *add* inſtead of.

l. 13. *For* even it is not free of the vinous, *read* it even admits of the vinous.

P. 51. l. 5. *For* nutritious juice, *read* gaſtric liquor.

l. 3. a fin. *Dele* by a weight appended.

P. 52. l. 7. *For* former *read* firmer.

P. 57. l. 6. *Dele* The pear, &c. *to* digeſted, *l.* 10.

P. 62. l. 2. *For* no, *read* little.

P. 64. l. 5. *For* Naſturtium, *read* Braſſica.

P. 69. l. 21. *For* red beet, *read* white beet.

P. 73. l. 11. *Dele* in the Eaſt-Indies, *to* European corn.

P. 81. l. 18. *For* culture, *read* manure.

Page 84. line 10. *For* which has made it a doubt, *read* but it is a doubt

P. 96. l. 19. *For* veal *read* chicken

P. 97. l. 20. *For* both ſolution, *read* both ſlow ſolution

P. 97. l. 27. *For* to this head, &c. *to* ſtimulus, *l.* 29. *read* to this head of difficult mixture; for though the vegetable food may continue long in the ſtomach, it gives little ſtimulus to the ſyſtem.

P. 98. l. 9. *For* cucumbers, &c. *read* cucumbers, fructus,

l. 11. *For* cauſe, *read* occaſional cauſe

P. 101. l. 3. *For* crude, *read* rude

P. 102. l. 21. *For* that men, *read* that thoſe men

P. 103. l 4. *For* ſciences, *read* ſcenes,

P. 110. l. 17. *For* like animal food it does not, *read* it does not like animal food,

P. 111. l. 8. & 9. *For* will often be ſo, *read* as it may often be

P. 113. l. 9. *For* rules of the cookery, *read* rules for the uſe

l. 18. *For* milk, &c. *to* expoſed to, *read* milk expoſed for ſome time to the air, ſuffers more or leſs of

P. 114. l. 10. *After* therefore, *add* the former

l. 11. *After* vigorous, *add* the latter

l. 18. *For* cured, *read* curd

l. 23. *For* or addition in, *read* in or added to

P. 115. l. 29. *For* cow's milk, &c. *to* all, *l.* 31. *read* cows milk allows leſs of its oil to be ſeparated with the whey; from that of ſheep and goats, there is more.

P. 116. l. 23. Condiments, &c. *to* conſtitutions, *ſhould be Italics.*

P. 119. l. 29. *For* roaſted is not, *read* boiled is

P. 120. l. 16. *For* more, *read* leſs

l. 17. *Dele* only

l. 18. *For* alſo, *read* rather

P. 129. l. 16. *Dele* upon the whole, *and to the end of the paragraph.*

P. 135. l. 5. *Dele* not

P. 138. l. 12. *After* beaſts, *add* and birds

P. 140. l. 10. *For* Rara, *read* Raia

Page 140. line 29. *For* Canus, *read* Genus

P. 149. l. 3. a fin. *For* ſtronger motions, *read* exerciſe

l. 2. a fin. *For* vigorous efforts, *read* activity.

P. 150. l. 20. *For* fiſhes *read* birds

P. 176. l. ult. *For* Wine, *read* Steel

P. 187. Note l. ult. *After* Ruſſel, *add* Diſſ. de Cupro Edin. 1757.

P. 191. l. 9. *For* in melting antimony with nitre, *read* by applying nitre to the martial regulus of antimony in fuſion.

l. 23. *For* conſequence, *read* cauſes

P. 215. Note. *For* by the late Dr Millar, *read* by Dr Cullen himſelf;

P. 217. l. 17. *For* Bold, *read* Bowles.

P. 226. l. 5. *After* butter, *add* rubbed on the outſide of the noſtrils.

P. 230. l. pen. *For* Borrago, *read* Ærugo,

P. 236. l. 13. *For* No doubt, &c. *to* likeways, l. 17. *read* Many think that emetics are ſpecifically diſpoſed to operate on the fibres of the ſtomach, and purgatives on thoſe of the inteſtines; and it is alledged, that, when mixed with the blood, their operation is only upon theſe parts: But, the experiments adduced in proof of this fact are very fallacious; and it is ſtill probable, that the effects of theſe medicines, as commonly exhibited, depend entirely on the quantity and ſolubility of the medicine, and ſenſibility of the different parts.

P. 237. l. 4. *For* operations, *read* ſecretions.

P. 238. l. 4. *For* if not, *read* and perhaps

l. 5. *After* organ, *place a point, and add,* If the ſtimulant externally applied acts only on the nerves of the ſkin, it will cauſe

l. 9. *For* This laſt has, *read* Theſe effects have

l. 11. *None of the manuſcripts we have ſeen make any tolerable ſenſe of this paragraph, and it ſhould therefore, perhaps, be left out altogether; but we ſhall venture to give here what we conceive to be the Doctor's ſenſe of this matter.*

Abſtracting from the effects of the increaſed action of the moving fibres upon the motion of the fluids, we think it proper here to conſider more ſimply the effects of ſtimulants on the moving fibres themſelves. Theſe are, in general, the increaſing the influx, or exciting the action of the nervous power in the fibres; and this, according to the different degrees of force in the ſtimulus, may be in different ſtates; as, 1. An increaſe of tone only. 2. Involuntary and convulſive action. And, 3. Spaſmodic contraction. The tone or conſtant tendency to contraction which ſubſiſts in the moving fibres of living bodies under any degree of extenſion, is partly owing to the elaſticity of the ſimple ſolid, but more conſiderably to the conſtant energy of the brain, in determining the nervous power into the moving fibres; and it is owing to the various ſtates of this energy of the brain, that we obſerve ſuch ſudden viciſſitudes of debility and ſtrength in the moving fibres of the whole body. Hence, ſtimulants applied to any part, often have their action communicated to the ſenſorium, and may increaſe the energy of the brain ſo much, as to increaſe the tone of the moving fibres over the whole ſyſtem. Theſe ſtimulants, therefore, may be employed as tonics, but ſeldom with conveniency, as they are apt to increaſe too much the action of theſe parts, which are otherways expoſed to a conſtant ſtimulus. Such is the ſanguiferous ſyſtem; and, as the inflammatory diatheſis conſiſts in the increaſed tone of the heart and arteries, our ſtimulants are very apt to induce or increaſe this diatheſis. However difficult it may ſeem to diſtinguiſh between the tonic effects of aſtringent, ſedative, and ſtimulant medicines, it is certain that the ſtimulants are more remarkable than the others for their inflammatory powers, and are therefore, upon many occaſions,

inconvenient. The influx of nervous power capable of giving tone, we ſuppoſe to be in a leſs degree than is neceſſary to excite contraction, and it is only when the ſtimulus is ſtronger, that contractions are produced. In theſe it is obſerved, that they are not naturally of long continuance, but are neceſſarily ſucceeded by a relaxation; and ſo far is this a law of the ſyſtem, that, in many caſes, tho' a ſtimulus is conſtantly applied, it does not produce a conſtant contraction, but a number of contractions alternating with relaxations. In this caſe, the motions are called convulſions. The motions appearing in this ſhape depend probably on the force of the ſtimulus, and the degree of contraction produced; for there is a contraction of muſcles which does not alternate with relaxation. It is what modern phyſicians more ſtrictly call a ſpaſm; and, as the contraction is not only more permanent, but appears alſo to be in a more conſiderable degree, we think it may be conſidered as the effect of a ſtronger ſtimulus. From the whole, it appears, that the effects of ſtimulants, as operating on the moving fibres only, are, increaſing tone, exciting convulſions, or producing ſpaſm; and that theſe will ariſe according to the degree of force in the ſtimulus and the irritability of the parts taken together.

Page 239. line 13. *For* haunch, *read* knee
P. 240. l. 14. *For* effects in, *read* indications with reſpect to
l. 17. *For* inconſiderable, *read* conſiderable
l. 22. *For* enduced, *read* induced
l. 26. *After* 3. *add* Where the languor and inertia are eſpecially in the extreme veſſels,
P. 241. l. 11. *For* effects on, *read* indications with reſpect to
P. 242. l. 5. *For* effects in, *read* indications with reſpect to
P. 244. l. 5. *For* being, *read* are
P. 245. l. 13. *For* effect, *read* purpoſe

Page 245. line 28. *For* muſt be laid aſide, *read* theſe may be neglected;
P. 247. l. 27. *For* oils, *read* extracts
l. penult. *For* eſſential oil with water, *read* water with eſſential oil,
P. 255. l. 7. *For* without acrimony or, *read* with little acrimony, and with little
P. 256. l. 18. *For* As being of the Verticillatae they, *read* As we have ſaid before of the Verticillatae, ſo the Umbellatae
P. 258. l. 15. *For* ʒi, *read* ʒiß
l. 31. *For* as on depending on, *read* by
P. 259. l. 13. *For* ſenſible, *read* inſenſible
l. 28. *For* trachea, *read* fauces,
P. 260. l. 11. *For* little, *read* no ſuch
P. 261. l. 4. a fin. *For* Alliaciae, *read* Alliaria
P. 264. l. 17. *For* in turpentine, *read* in oil of turpentine,
P. 265. l. 1. *For* in, *read* ſo they do
l. 2. *For* They have, *read* and have therefore
l. 21. *For* have the ſame good conſequence, *read* but it was with the good conſequence of ſuppreſſing the gleet.
P. 271. l. 14. *For* proper, *read* peculiar
P. 274. l. 2. *After* often, *add* a part of
l. 18. *After* other, *add* exotic
P. 275. l. 12. *For* though ſometimes he is, *read* for from theſe we underſtand them better, and are leſs
P. 276. l. 20. *For* G. Alpinus, *read* L. Apinus.
P. 277. l. 14. *For* in turpentine, *read* in oil of turpentine.
P. 278. l. 17. *After* diſcoverable, *add* only
P. 284. l. 10. *For* four, *read* three
l. 26. *After* Abſynthium, *add* vulgare
l. ult. *After* that, *add* not
P. 288. l. 3. a fine *For* of the paroxyſm, *read* of paroxyſms,
P. 293. l. 15. *Here, and in ſeveral other places of this paragraph, for* intermiſſion, *read* remiſſion
P. 294. l. 22. *For* Warhoff, *read* Werlhoff,

P. 295. l. 26. *For* the degree, *read* the ſymptoms
l. 31. *For* cauſe of the, *read* cauſe and
P. 301. l. 3. *After* ℥i. *add* at one doſe,
l. 7. *For* of the bark, *read* for the uſe of the bark,
l. 7. *For* but here, as in, *read* as even in
l. 12. *Dele the whole line, and read,* the paroxyſm does not come on, and no ſenſe of cold, paleneſs of the nails, or languor,
P. 315. l. 20. *For* as ſtimulant without the narcotic qualities, *read* In ſtrong wines both the ſtimulant and narcotic qualities are in a high degree
P. 326. Note l. 6. *For* arrive, *read* ariſe
P. 333. l. 15. *For* deſtroys, &c. *to* removed, *read* weakens the powers of ſenſe and voluntary motion, by weakening the energy of the ſenſorium.
P. 343. l. 5. *For* affected, *read* affecting
P. 344. l. ult. *For* Trallius, here and in other places, *read* Tralles.
P. 345. l. 8. *For* that fever, &c. *to* repetition, *read* that every continued fever conſiſts of repeated paroxyſms.
l. 15. *After* remedy, *add* to
l. ult. *For* have we, *read* as we have
P. 347. l. 14. *For* confined to, *read* retained in
P. 351. l. 22. *After* moſt, *add* diſtant
P. 353. l. 5. *For* which, &c. *to* ſuppuratory, *read* which has been ſuppoſed to be the poiſoning
l. 19. *Dele* Regnerus.
l. 26. *For* Lamberkin, *read* Lambergen,
P. 356. l. 8. *Dele* not
P. 357. l. 3. *Dele* bark
P. 360. l. 20. *We are now enabled, by a ſight of other manuſcripts, to put the whole of this paragraph in a better condition; and give it accordingly as follows:*

With regard to every affection of the nervous power, we have been much in the dark, and particularly, with regard to the nature of ſpaſmodic affections, and antiſpaſmodic remedies. The learned Gaubius thus defines ſpaſm: *Spaſmus dicitur violenta, invita, inordinata fibrarum motricium actio.* The original word in the Greek language means no more than contraction; but it is neceſſary to diſtinguiſh thoſe contractions which are performed in health, from thoſe which are morbid, and it is only to the laſt that the term ſpaſm is now applied. Dr Gaubius, by the terms of his definition, intends to expreſs the circumſtances of the morbid ſtate. The actions of muſcles are voluntary or involuntary, the firſt are morbid when *invitae*, and both are ſo when *violentae et inordinatae*. But, to render the definition ſtill clearer, the term *inordinata* muſt be underſtood to comprehend a great deal with reſpect to both the cauſe and the manner of contraction: Thus, the contraction of the heart is ordinarily excited by the influx of venous blood, and, in health, is in proportion to the ſtate of that; but, if excited by other cauſes, it may be ſaid to be an *inordinata contractio*. The term ſeems to be more properly applied to ſome irregularity in the manner of contraction; and we ſhall mention a chief inſtance of this kind. We think it is a law of the animal oeconomy, that the contraction of moving fibres is naturally ſucceeded by a relaxation of them; and, commonly, the muſcles contracted by the power of the will, or other natural cauſes, are eaſily ſtretched out again by their antagoniſts, or other powers applied. If, therefore, it happens, that the contraction of a muſcle is not ſpontaneouſly ſucceeded by a relaxation, and does not eaſily yield to antagoniſt or other

ſtretching powers applied, ſuch a contraction may be ſaid to be *inordinata*; and it is to this ſtate of contraction, that many of the moderns confine the term ſpaſm, while the other ſtates of inordinate contraction they call convulſions. Thus, Dr Gaubius, 'Qui ſpaſmum 'a convulſione diſtinguunt, illum vocant continuam, 'hanc alternantem, muſculorum contractionem.' This excellent author, however, is doubtful if ſuch diſtinction is neceſſary; 'Perinde fuerit,' ſays he, 'num eodem 'an diverſis nominibus utere: Uterque enim effectus 'ad idem genus pertinet, partes eaſdem occupat, ſi-'mileſque et cauſas et differentias agnoſcit; quin et 'haud raro alius in alium tranſit.' It is certainly juſt, as the learned author obſerves, that theſe affections are nearly related to each other, and truly belong to one genus; but, at the ſame time, they are evidently different ſpecies, and may therefore properly be diſtinguiſhed by different appellations. However, we muſt own, that this is hardly the place for it, as we cannot ſay that the ſeveral medicines to be here mentioned under the title of antiſpaſmodic, are more ſuited to the one than to the other ſpecies of affection. We find ourſelves obliged to comprehend both caſes under the title of ſpaſmodic affections; and, by antiſpaſmodic, we mean ſuch medicines as are ſuited to take off either, or both affections.

As to their manner of operating, it is difficult to explain. Spaſmodic affections may depend upon an extraordinary influx of nervous power, and that, either in conſequence of a ſtimulus applied to the part or to the ſenſorium, or in conſequence of an unequal diſtribution, depending upon the weakneſs and mobility of the nervous power. From hence it may be perceived,

why ſometimes ſedatives and ſometimes ſtimulants prove antiſpaſmodic, and ſome have thought, that all antiſpaſmodics are either the one or the other; but beſides thoſe more obviouſly ſedative or ſtimulant, there ſeem to be antiſpaſmodics diſtinct from both. Stimulants are very generally ſuch to the ſanguiferous ſyſtem, and very often ſedatives ſhew the ſame effects; but there are antiſpaſmodics which do not at all. Again, there are antiſpaſmodics which diſcover none of the narcotic qualities of ſedatives; and therefore, from both conſiderations, we preſume there are antiſpaſmodics diſtinct from both the ſtimulants and ſedatives. We ſhall indeed have occaſion frequently to ſay, that the antiſpaſmodics are intimately connected with theſe other claſſes; but ſtill, we do not allow this to be univerſal, and would rather aſſert, that moſt of the medicines in our liſt of antiſpaſmodics are more ſuch than in proportion to their ſtimulant or ſedative properties.

Page 366. line 21. *For* which, &c. *to* as, *read* wherefore, as plants of this claſs are frequent in Europe, and

P. 369. l. 3. & p. 374. l. 5. a fine *For* Mangini, *read* Menghini.

l. 23. *For* it is rejected with an uneaſy ſenſation, at the ſame time producing heat, *read* this is affected with an uneaſy ſenſation of heat,

l. 26. *For* the diverſity, *read* this diverſity

l. pen. *For* in its, *read* with reſpects to its

P. 370. l. 17. *After* recommended, *add* in epilepſy,

P. 371. l. 3. a fine *And in other places of this paragraph, for* Eriſypelas, *read* Eryſipelas.

P. 372. l. 15. *For* over, *read* even.

P. 375. l. 7. *For* lateritiae, *read* lateritium;

P. 385. l. 4. *For* ſtretching, *read* ſtraitening

l. 26. *For* of that impregnation, *read* of it in that condition.

Page 386. line 2. *For* with, *read* from

P. 387. l. ult. *We would wish to say here, that this censure of Dr Haller's works must be understood to be strictly confined to those parts of it only which relate to the chemical doctrine of the fluids; for we know that in other respects our author has a high esteem of the judgment and erudition of Dr Haller.*

P. 390. l. 12. *For* even admit not of diffusion, *read* readily admit of diffusion;

l. 14. *For* decomposition, *read* resolution of theirmixture.

P. 391. l. 6. *For* the admixture of the whole, *read* their being laid on one another;

P. 393. l. 18. *Before* There, *add* Besides these

l. 19. *For* blood, *read* body,

l. 20. *After* and, *add* may again be

l. pen. *For* in, *read* from

P. 394. l. 3. a fine *For* formerly, *read* formally

l. ult. *For* changed, *read* formed

P. 395. l. 5. & 6. *For* perfectly extract, *read* fairly resolve

l. 7. & 10. *For* decomposition, *read* resolution.

l. 11. *After* it, *add* in its original form.

P. 469. l. 5. *For* did not beware, *read* was not aware

l. 10. *For* flowing ropy from the vein, *read* of blood's concreting, and forming a rope as it flowed from the vein,

l. 12. *For* vessel, *read* limb

P. 397. l. 19. *For* body, bottom, *read* a solid body immersed, the bottom,

P. 399. l. 26. *For* are far from being of a perfect disposition, *read* seem not to be of a perfect fluidity,

P. 400. l. 4. *For* to each other, *read* of each.

l. 7. *For* arising; 1. *read* and

Page 400. line 23. *After* lentor, *add* and if at any time the ſecretions be diminiſhed, the ſaline parts muſt be increaſed, muſt become more and more putrid, and thereby occaſion a greater fluidity of the whole.

l. 27. *Dele* the ſame effect, &c. *to* denſity, *l.* penult.

P. 401. l. 5. *For* This may, &c. *to* back, *l.* 6. *read* This may be diminiſhed either by too great evacuation or by the ordinary evacuation not being ſupplied by drink.

P. 401. l. 10. *For* more faeces are produced, *read* leſs nouriſhment is extracted,

l. 15. *For* it, *read* is

l. 18. *Dele* except, &c. *to* ſolids, *l.* 19.

l. 25. *For* there is, &c. *to* ſecretion, *read* there is no exhalation or diſſipation of fluid parts but what is made by ſecretion.

l. 26. *After* than, *add* that

l. 27. *After* reſt, *add* is produced ;

P. 402. l. 21. *Dele* or the moving power

P. 404. l. 29. *Dele* and it is, &c. *to* reſtored, *l.* 31.

P. 405. l. 19. *For* cauſe, *read* ſubject

P. 406. l. 23. *For* diffuſed over the ſyſtem, *read* is diffuſed over the ſyſtem, and

P. 407. l. 21. *For* whence, *read* when

l. 22. *For* curdles it, *read* ſeparates the oil,

l. 27. *For* Now when this is gone, I find, *read* Now though this diſeaſe is gone, I ſtill find

P. 411. l. 5. *For* xii. *read* a large quantity,

P. 412. l. 24. *After* one, *add* part

P. 414. l. 24. *After* membrane, *add* or into the cavities,

P. 415. l. 6. *Before* A faulty, *add* The fluidity of the blood may alſo be varied by the proportion and ſtate of the more denſe and concreting parts of it, and the fluidity may be increaſed either by a defect of theſe parts, or by a diminution of their force of coheſion,

Page 415. line 6. *For* ſolid parts, *read* of the more conſiſtent parts of the blood,

l. 16. *After* but, *add* in

l. 26. *Dele* Whatever, &c. *to* putrefaction, *l.* 30. *and add,* This may happen from the fluids proceeding too far towards, putrefaction, or from other cauſes, of an over proportion of ſaline matter in the blood.

P. 416. l. 9. *For* ſecond, *read* firſt

l. 10. *For* viſcidity of the fluids, *read* viſcid fluids,

l. ult. *After* demulcents, *add* which

P. 417. l. 4. *For* putrid, *read* acrid

P. 419. l. 16. *For SIMPLE GUMS,* read *MUCILAGINOSA.*

l. 20. *For* ʒii *read* ʒiv

P. 420. l. 7. *For* the foundation of, *read* to have its virtues depending on

l. pen. *For* foreign, *read* different

P. 422. l. 19. *For* I doubt, &c. *to* ſubclavian, *l.* 19. *read* I doubt if even the chyle ever appears there, as ſome alledge, conſidering the diffuſion it muſt undergo immediately after paſſing from the thoracic duct into the ſubclavian vein.

P. 428. l. 1. *After* aloes, *add a point,* and *after* ointments, *add* it has been

P. 429. l. 18. *For* and beſides, &c. *to* doſe, *read* and when the alkali of the ſoluble tartar is taken away, the cream of tartar does not remain in a ſufficient

P. 431. l. 9. *For* that art has, *read* that medicines have

P. 432. l. 3. *Dele* only

l. 5. *For* acid, *read* metal.

l. pen. *For* rather have, *read* ſhew

l. pen. *For* viz. &c. *to* aphthae, *read* and their operation is probably by ſtimulating the excretories, and drawing forth a fluid, by which cruſts and ſloughs are puſhed of.

P. 432. l. ult. *For* cough, *read* catarrhal affection,

P. 433. l. 1. *For* mouth, *read* mouth of the glands or throat,

Page 433. line 22. *After* diſorder, *add* unripe fruit are much leſs diſpoſed to ferment than the ripe;

P. 434. l. 6. *For* aceſcents, *read* acids, *and for* acids, *read* aceſcents

l. 8. *After* ſome, *add* bad

l. 14. *For* ſyſtems, *read* parts of the ſyſtem.

P. 435. l. 3. *For* exerting, *read* exerted

P. 437. l. 8. col. 1. *Dele* elix. vitr. dulce

l. 8. col. 2. *Dele* nitrum coraliatum

l. 22. *After* included, *add* here

l. pen. *After* but, *add* their defects are ſupplied, and

P. 438. l. 5. *The diffidence expreſſed in this paragraph, however proper in general, happened to be ill placed here. We are well perſuaded, that Dr Cullen is now ſatisfied that the experiments of Sir John Pringle are ſufficiently confirmed, and appear to have been planned with ſagacity, executed with exactneſs, and communicated with the greateſt fidelity. In ſhort, every one is now agreed, that this excellent philoſopher and phyſician has made very uſeful and important diſcoveries on this ſubject.*

l. pen. *For* method, *read* operation

P. 439. l. 12. *After* evacuants, *add* diffuſed

P. 440. l. 2. *After* applied, *add* near

l. 12. *For* in the head, *read* about the head,

P. 443. l. 1. *For* increaſing, *read* breaking

P. 450. l. 1. *For* one twentieth part of a grain, *read* a very ſmall quantity

P. 452. l. 12. *For* Draſſiae, *read* drageae

P. 453. l. 6. *Dele* ſmall, *and after* calomel, *add* alone

l. 15. *After* is, *add* again

P. 454. l. 1. *For* diffuſe, *read* difficult

l. 8. *After* mercury, *add* as the corroſive ſublimate

l. 20. *For* means, *read* cauſes

P. 457. l. 8. *For* hydropic, *read* hydragogue

Page 458. line 13. *For* of ʒii or ʒiii, *read* of from ʒii to ʒviii
P. 463. l. 3. *For* prevents, *read* occaſions
l. 4. *After* blood, *add* which uſually happens
P. 465. l. 7. *For* Practitioners have ſpoke of giving, *read* The ſame Dr Robinſon gave
P. 467. l. 15. *Dele* and ſulphur,
P. 468. l. 6. *After* mercury, *add* combined with
P. 469. l. 26. *For* crocus, *read* regulus
l. pen. *For* Corrichuis, *read* Cornachini,
l. pen. & ult. *For* emetic nitre, *read* emeticum mite
P. 475. l. 1. *After* purge, *add* the whole body
l. 13. *For* where in conſequence of the, *read* whereby they make a
l. 14. *After* head, *read* and
l. 15. *After* evacuation, *add* made from the extremities of the deſcending aorta,
l. 25. *After* cathartics, *add* but it may be proper alſo to point out more particularly ſome of their bad effects,
P. 477. l. 16. *For* ʒiii, *read* ʒii
l. 19. *For* irritability, *read* ſome of its purgative quality
l. 19. *For* from, *read* by
l. 20. *For* without, *read* free from
l. 30. *Before* haemorrhoidal, *add* and
P. 484. l. 2. *For* beſt, *read* moſt frequently employed.
l. 25. *For* diffuſed in water, *read* very well divided,
P. 485. l. 12. & 13. *For* The Pharmacop. Edinenſis, *read* They
l. 28. *For* and this, *read* This for diſſolving ſilver
P. 486. l. 21. *After* theſe, *add* in increaſing urine,
l. 22. & 23. *Dele* Dr Ward's powder is the only certain diuretic
l. 23. *For* This, *read* The failure of the diuretics
l. 25. *Dele* and alſo, *add*, We may be diſappointed in many ſuppoſed diuretics

Page 486. line 29. *For* aſtringentibus curando, *read* per aſtringentia pellendo,
P. 487 l. 18. *After* abſorption, *add* they draw out
P. 488. l. 8. *For* caſe, *read* practice
P. 489. l. 11. *For* mitigated with acids, *read* properly diluted,
l. 29. *For* without, *read* with our
P. 490. l. 9. *For* found, *read* founded
P. 491. l. 2. *For* an intermiſſion, *read* a new acceſſion,
l. 30. *After* motion, *add* has been blamed
l. pen. *For* whether is, *read* whether it is
P. 492. l. 22. *After* explained, *add* by ſuppoſing an affinity between the medicine and the fluid to be ſecreted,
l. 23. *For* none ſuch, *read* no ſpecific ſtimuli of the uterus
P. 493. l. 5. *For* derivation, *read* determination,
l. 25. *For* eſtabliſhed, *read* near at hand,

MVSEVM
BRITAN
NICVM